

THE TECHNOLOGY REVIEW

RELATING TO THE MASSACHUSETTS
INSTITUTE
OF TECHNOLOGY



PUBLISHED BY
THE ALUMNI ASSOCIATION

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THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Cambridge, Mass.

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY aims to give thorough instruction in *Civil, Mechanical, Chemical, Mining, Electrical and Sanitary Engineering*; in *Chemistry, Electrochemistry, Architecture, Physics, Biology and Public Health, Geology, and Naval Architecture*.

To be admitted to the Institute, the applicant must have attained the age of seventeen years and must pass examinations in algebra, plane and solid geometry, physics, history of the United States (or ancient history), English, French and German. Preparation in some one of a series of elective subjects is also required. A division of these examinations between different examination periods is allowed. In general, a faithful student who has passed creditably through a good high school, having two years' study of French and German, should be able to pass the Institute examinations.

Graduates of colleges, and in general all applicants presenting certificates representing work done at other colleges, are excused from the usual entrance examinations and from any subjects already satisfactorily completed. Records of the College Entrance Examination Board, which holds examinations at many points throughout the country and in Europe, are also accepted for admission to the Institute.

Instruction is given by means of lectures and recitations, in connection with appropriate work in the laboratory, drawing-room or field. To this end extensive laboratories of chemistry, physics, biology, mining, mechanical engineering, applied mechanics, and the mechanic arts, have been thoroughly equipped, and unusual opportunities for field-work and for the examination of existing structures and industries have been secured. So far as is practicable, instruction is given personally to small sections rather than by lectures to large bodies of students.

The regular courses are of four years' duration, and lead to the degree of Bachelor of Science. In most courses the work may also be distributed over five years by students who prefer to do so. Special students are admitted to work for which they are qualified; and the degrees of Master of Science, Doctor of Philosophy, and Doctor of Engineering are given for resident study subsequent to graduation. Opportunity for research is offered in all the departmental laboratories, in the three recently established Research Laboratories of Applied Chemistry and Physical Chemistry, and in the Sanitary Research Laboratory and Sewage Experiment Station.

The tuition fee, not including breakage in the laboratories, is \$250 a year. In addition, \$30 to \$35 per year is required for books and drawing materials.

For catalogues and information, address

ALLYNE L. MERRILL, *Secretary of the faculty*,
Mass. Inst. Technology,
Cambridge, Mass.

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The Council meets at the Engineers Club, Boston.

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ORGANIZED IN NEW YORK, JANUARY 17, 1913

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LOCAL ALUMNI ASSOCIATIONS

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- ☞ Luncheon—First Saturday of the month at the University Club, Akron, Ohio.
- Albany—TECHNOLOGY CLUB OF ALBANY AND SCHENECTADY, E. H. Sargent ('07), Secretary, 719 State Street, Albany, N. Y.
- Atlanta—ATLANTA ASSOCIATION M. I. T., W. J. Sayward ('01), Secretary, 633 Chandler Bldg., Atlanta, Ga.
- ☞ Luncheon—Saturdays at 1 p. m. at the Hotel Ansley Rathskeller.
- Birmingham—SOUTHEASTERN TECHNOLOGY ASSOCIATION, F. C. Weiss ('13), Alabama Power Co., Birmingham, Ala.
- ☞ Luncheon—First Wednesday of each month at 1 o'clock at the Hillman.
- Boston—TECHNOLOGY CLUB OF BOSTON, Dr. Robert Seaton Williams ('02), Secretary, Mass. Inst. of Tech., Cambridge, Mass.
- Bridgeport—TECHNOLOGY CLUB OF BRIDGEPORT, Wilbur A. Swain ('15), Secretary, Criterion Club, Bridgeport, Conn.
- Buffalo—TECHNOLOGY CLUB OF BUFFALO, E. Earle Root ('11), Secretary, Buffalo Standard Ink Corp., Buffalo, N. Y.
- ☞ Luncheon—First Thursday of month, 12.30 p. m. at Buffalo Chamber of Commerce.
- Butte—TECHNOLOGY ASSOCIATION OF MONTANA, C. D. Demond ('93), Secretary-Treasurer, 704 Main Street, Anaconda, Mont.
- Chicago—NORTHWESTERN ASSOCIATION M. I. T., Harvey S. Pardee ('09), Secretary-Treasurer, 111 W. Washington Street, Chicago, Ill.
- ☞ Luncheon—Tuesdays at 12.30 p. m. at Engineers Club, 314 Federal St., Chicago, Ill.
- Chile—TECHNOLOGY CLUB OF CHILE, J. L. Bray ('12), Secretary, Braden Copper Co., Rancagua, Chile.
- China—TECHNOLOGY CLUB OF CHINA, William A. Adams ('08), Secretary-Treasurer, 39 Nan-king Road, Shanghai, China.
- ☞ Luncheon—First Saturday of the month, at 12.30, at the Carlton.
- Cincinnati—THE CINCINNATI M. I. T. CLUB, Edward H. Kruckemeyer ('11), Secretary, 111 East 4th Avenue, Cincinnati, Ohio.
- ☞ Luncheon—Tuesdays from 12.00 to 2.00 p. m. at the Metropole Hotel, Walnut Street, above Sixth.
- Cleveland—TECHNOLOGY CLUB OF NORTHERN OHIO, Allen Spicer ('13), Secretary, Mechanical Rubber Co., Cleveland, Ohio.
- CONNECTICUT VALLEY TECHNOLOGY ASSOCIATION, Ernest W. Pelton ('03), Secretary, 77 Forest Street, New Britain, Conn.
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- ☞ Luncheon—Tuesdays at 12.15 at the Dayton Engineers Club.
- Denver—ROCKY MOUNTAIN TECHNOLOGY CLUB, John J. Mullen ('08), Secretary, 860 Emerson Street, Denver, Col.
- ☞ Luncheon—Wednesdays from 12.30 to 1.30 p. m. at Colorado Electric Club, Chamber of Commerce Bldg., Denver, Col.
- Detroit—DETROIT TECHNOLOGY ASSOCIATION, D. V. Williamson ('10), Secretary-Treasurer, The Detroit Edison Co., Whitney Bldg., Detroit, Mich.
- ☞ Luncheon—First Wednesday of each month at 12.30 at the Detroit Board of Commerce.
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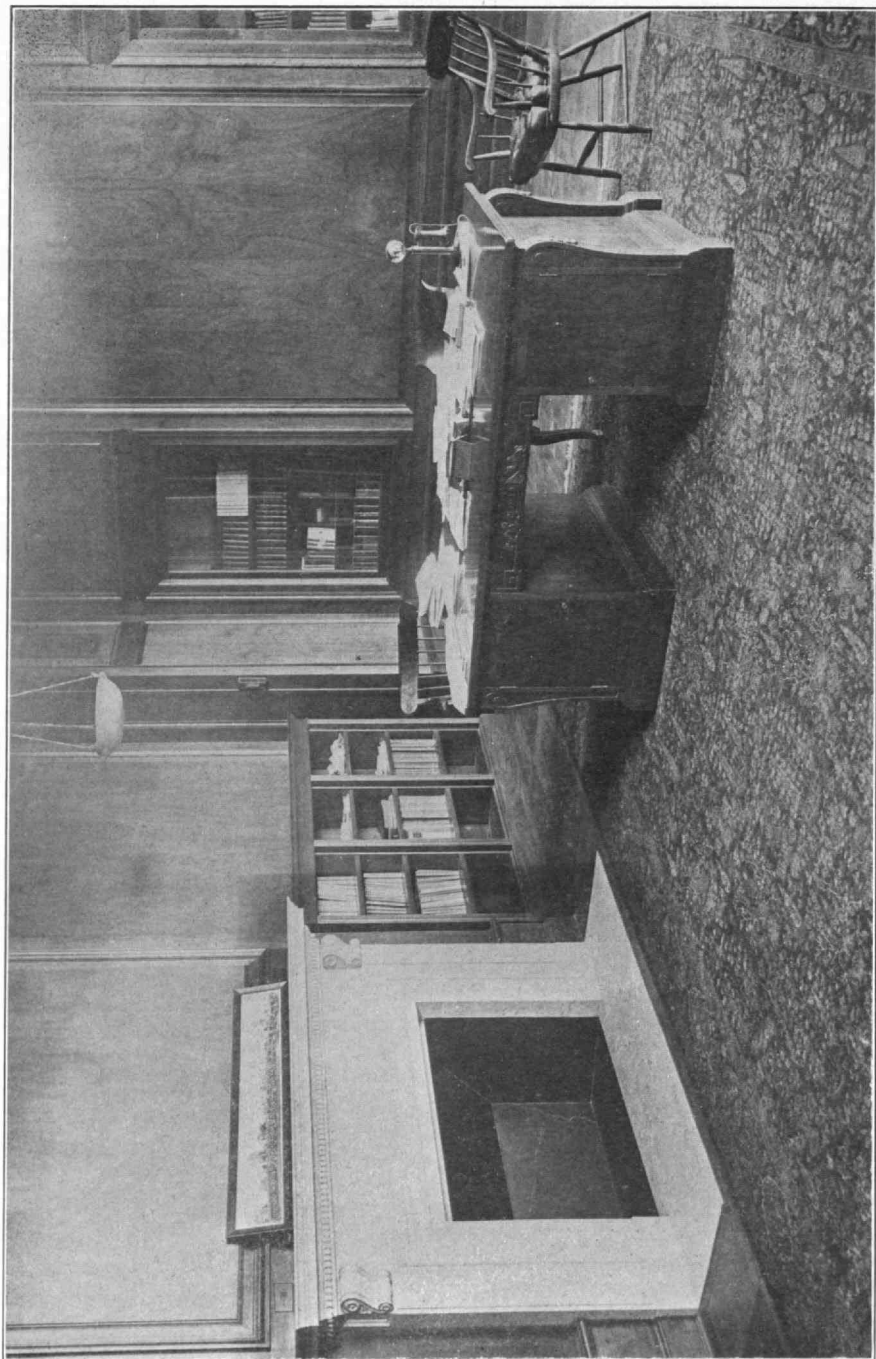
FIXED LUNCHEONS

- Akron—M. I. T. Club of Akron, Ohio, at the University Club, first Saturday of the month.
- Atlanta—Atlanta Association of M. I. T., at Hotel Ansley Rathskeller, Saturdays, at 1 p. m.
- Birmingham—Southwestern Technology Association, first Wednesday of month at 1 o'clock at the Hillman.
- Buffalo—Technology Club of Buffalo, Chamber of Com., on first Thursday of month at 12.30.
- Chicago—Northwestern Association of M. I. T., Engineers Club, Tuesdays at 12.30 p. m.
- Cincinnati—Cincinnati M. I. T. Club at the Metropole Hotel, Walnut Street, above Sixth, Tuesdays from 12.00 to 2.00 p. m.
- Dayton—Dayton Technology Club, Tuesdays, at 12.15 at the Dayton Engineers Club.
- Denver—Rocky Mountain Technology Club, Wednesdays, from 12.30–1.30 p. m. at Colorado Electric Club, Chamber of Commerce Bldg., Denver, Col.
- Detroit—Detroit Technology Association, first Wednesday of each month at 12.30 at the Detroit Board of Commerce.
- Indianapolis—Indiana Association, 15th day of each month at the University Club.
- Los Angeles—Technology Club of Southern California, at the University Club, on the first Wednesday of each month.
- Milwaukee—Technology Club of Milwaukee every Thursday noon at the University Club.
- Portland—Technology Association of Oregon every noon at the Hazelwood Lunch.
- San Francisco—Technology Association of Northern California, at the Engineers Club, 61 Post Street, second Tuesday of each month.
- Seattle—Technology Club of Puget Sound, third Friday of each month at 12.15 at the Commercial Club, 2d Avenue and Union Street, Seattle.
- Shanghai—Technology Club of China, first Saturday of the month, at 12.30, at the Carlton.

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THE NATIONAL VALUE OF SCIENTIFIC RESEARCH*

Our duty to the Nation—How Institute graduates can aid materially in preserving peace and reducing the sufferings of war

As we meet for the first time in this superb building, typical of the enlarged opportunities of the twentieth century, our thoughts go back to William Barton Rogers, founder and first President of the Institute. Combining in exceptional degree the appreciation of research and the constructive imagination of the man of science with the public spirit and the long vision of the statesman, he understood in the midst of the Civil War the deeper needs of the United States. Today, under the sharp demands of another and greater war, all countries have been forced to recognize their dependence upon science.

Recruiting its ablest investigators from the laboratories of London and other centers, as well as from the halls of Oxford and Cambridge, the British nation has attacked with vigor and success the problems of war and industry which have suddenly pressed for solution. Their naval establishment, always of high efficiency, has attained a new pitch of perfection. Their airplanes, inferior at the outset to those of the Teutonic powers, now appear to be assuming the command of the air. Their dirigibles, if still out-ranked by the Zeppelins, are rapidly approaching the same level of excellence. All this has sprung from science, spurred into activity for national service, pressed forward by the same patriotism which has filled the trenches and manned the guns of the Grand Fleet. And if war now dominates the field in England and in France, there are men and organizations in both countries who recognize that

*Address delivered at the opening exercises of the Massachusetts Institute of Technology, October, 1916.

the greater trial may come later, when the united industries of Germany, surprisingly developed by scientific research, will fight a fierce industrial war in the markets of the world.

Under such conditions, which must affect our own industries in almost equal degree, it is interesting to examine the early records of the Institute, and to recall the words used by Rogers in his first project for the school. In a report entitled "Objects and Plan of an Institute of Technology," prepared in 1860, Rogers wrote as follows:

To secure a steady prosperity in the midst of the busy inventions and rapidly expanding knowledge which mark the industrial pursuits in the leading European nations, we feel that it has become indispensable for us to provide, at least as effectually as they have done, such facilities for practical knowledge, and for the intelligent guidance of enterprise and labor, as may make our progress commensurate, step by step, with the advances of scientific and practical discoveries.

Going on to describe his plan for the Institute, he laid first emphasis upon a department which subsequently received far less attention than it deserved:

Under the first of these characters,—that of a Society of Arts,—the Institute of Technology would form itself into a department of investigation and publication, intended to promote research in connection with industrial science. . . .

The chief functions were to be performed by "the Committees of Arts, designed to form in a large measure the working power of the Institute." These were to

be charged with the consideration of all questions and interests relating to the several branches which may be brought to the notice of the Institute and be empowered or required to report their suggestions to the general meeting. It should also be their province to propose subjects for investigation in their respective departments, to recommend experiments and trials of processes and machinery, and to designate such inventions or improvements as may be deemed worthy of special commendation or honorary reward.

As for Rogers' attitude toward pure science:

We read in the history of social progress ample proofs that the abstract studies and researches of the philosopher are often the most beneficent sources of practical discovery and improvement.

And in his last address to the Institute:

Formerly, a wide separation existed between theory and practice; now, in every fabric that is made, in every structure that is reared, they are closely united into one interlocking system; the practical is based upon the scientific, and the scientific is solidly built upon the practical.

In the first period of the Institute's history, its work has consisted very largely of instruction, though investigation has become an increasingly prominent activity since the establishment by Dr. Noyes in 1903 of the Research Laboratory of Physical Chemistry. This laboratory, with those of industrial chemistry, sewage and sanitation, electrical engineering, aeronautics, gas engineering, etc., have not only advanced science and engineering through research, but have stimulated instruction by rendering visible to all students the daily growth of knowledge. May we not hope, now that the material needs of the Institute have been so largely met by the provision of this great group of buildings and by large additions to the endowment, that these laboratories may be more adequately supported, and that research may at last be raised to the high place which Rogers, with characteristic insight, felt that it should occupy? And may we not expect that pure science, which has advanced in this respect less rapidly than the industrial arts, will be recognized at its true value as the foundation stone of the Institute, and be permitted to assume equal importance in the research laboratory, as well as in the curriculum? Only thus can the highest success be attained.

It is a satisfaction to find the true significance of pure science widely proclaimed from the walls of these buildings, where the great names of Aristotle, Archimedes, Leonardo da Vinci, Copernicus, Newton, Lavoisier, Franklin, Faraday, Darwin, and Pasteur, flanked by many lesser ones, tell a tale that needs no comment.

William Barton Rogers, President of the Institute, was also president of the National Academy of Sciences, which dates, like the Institute itself, from the troubled year of 1863. Benefits similar to those which the Institute, chiefly by research, was to confer upon those who came within its circle, the Academy was intended to render to the national government. Constituted of the fifty leading representatives of the science and engineering of the day, the Academy received its federal charter from the hands of President Lincoln while the war was still in progress. This charter provides that

the Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art.
 . . . (Act of Congress, approved March 3, 1863.)

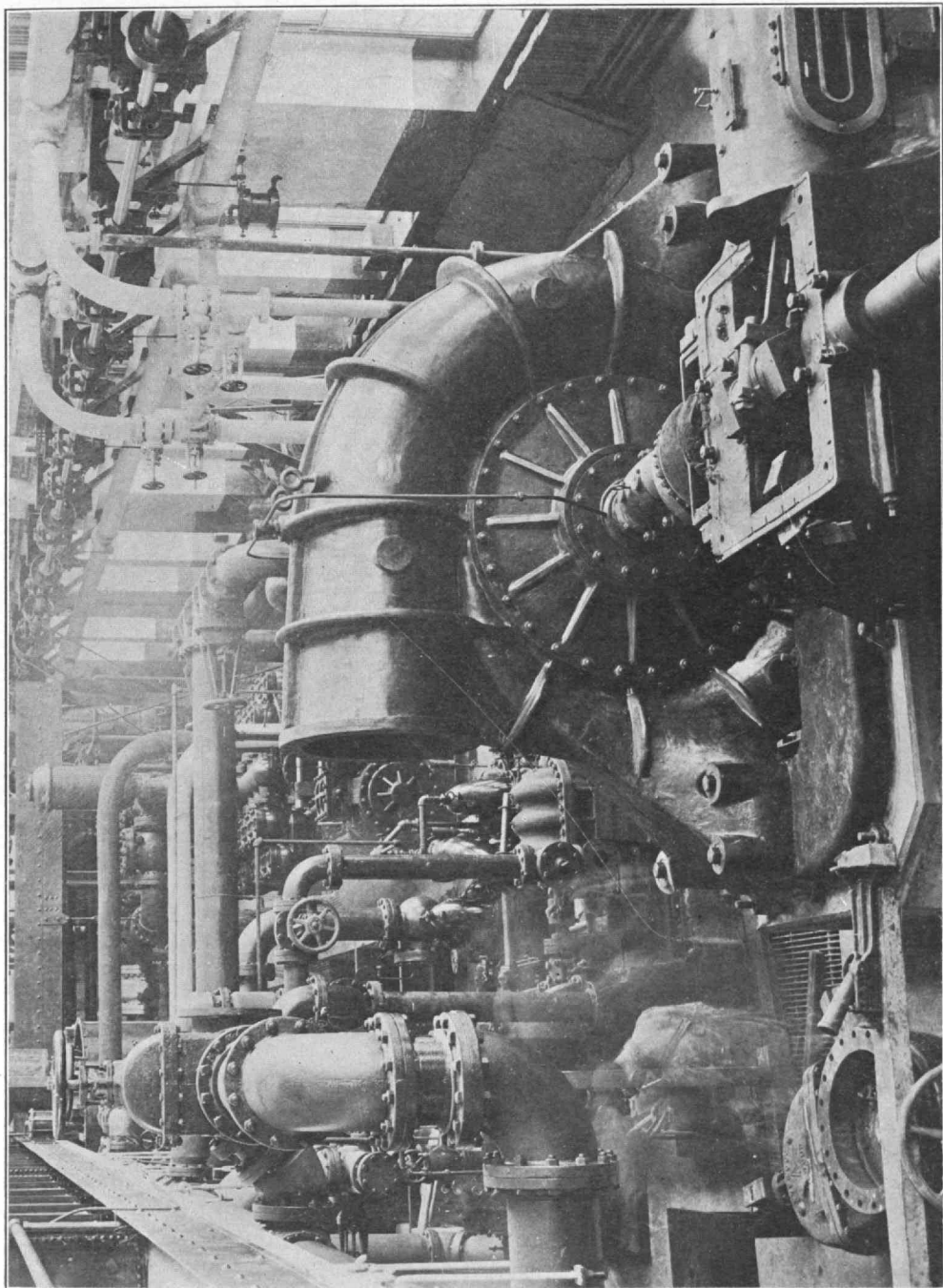
Under this provision, the Academy has been repeatedly asked to

advise the President, both Houses of Congress, and the heads of governmental departments. A few of these cases are cited below:

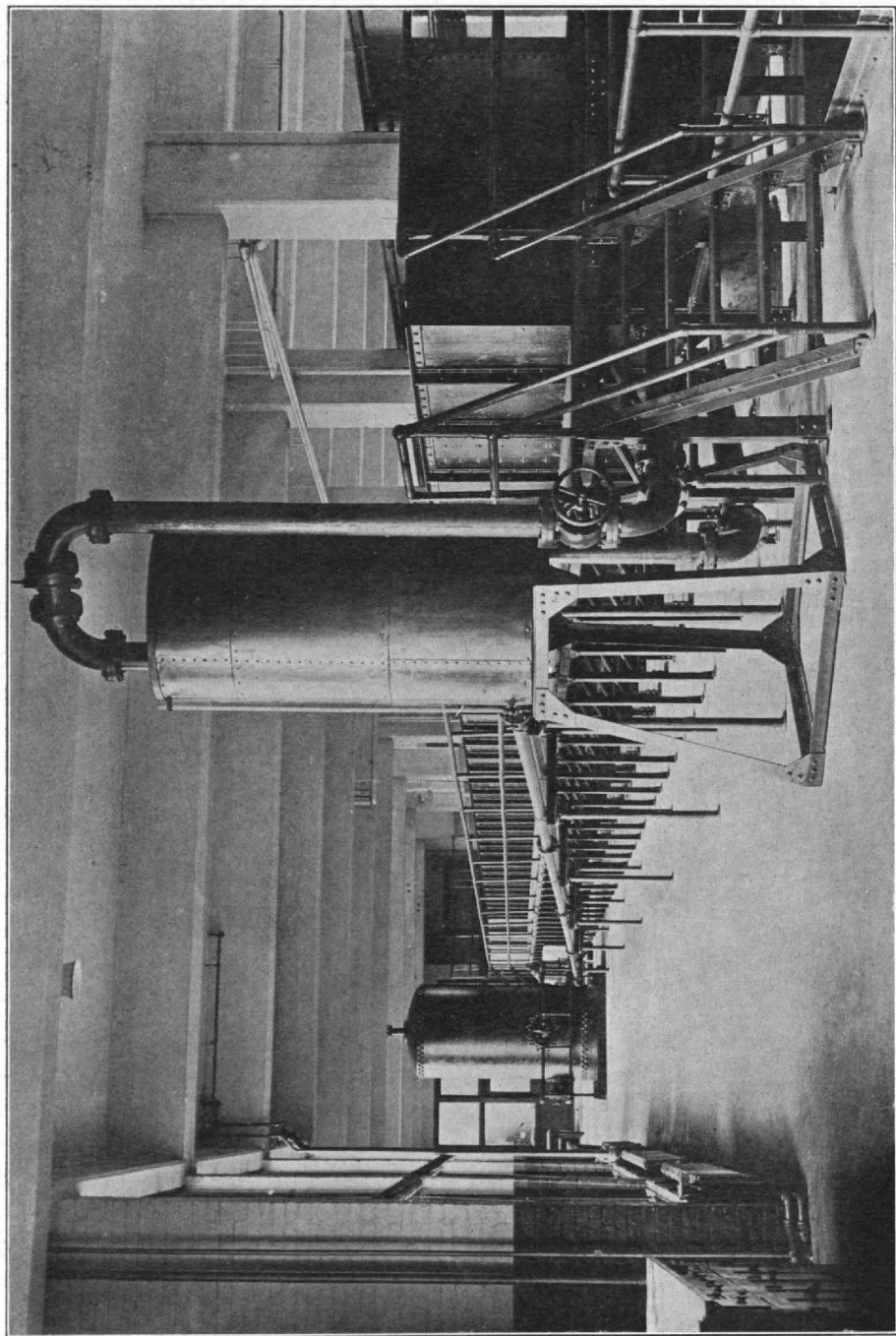
- (1) Committees appointed in accordance with Acts of Congress:
 1871. On the Transit of Venus.
 1872. On Preparing Instructions for the *Polaris* Expedition.
 1878. On a Plan for Surveying and Mapping the Territory of the United States.
 1879. On a National Board of Health.
 1894. To Prescribe and Publish Specifications for the Practical Application of the Definition of the Ampere and Volt.
 1908. On the Method and Expense of Conducting Scientific Work under the Government.
- (2) Committees appointed at the request of Joint Commissions and Committees of Congress:
 1884. On the Signal Service of the Army, the Geological Survey, the Coast and Geodetic Survey, and the Hydrographic Office of the Navy Department.
 1902. On the Establishment of a National Forest Reserve in the Southern Appalachians.
- (3) Committees appointed at the request of the President of the United States:
 1870. On the Protection of Coal Mines from Explosion by Means of Electricity.
 1902. On Scientific Explorations in the Philippines.
 1915. On the Slides of the Panama Canal.

Many of the minor questions of science formerly referred to the Academy, now go more appropriately to the various scientific bureaus which have been established by the government in recent years. Large problems arise from time to time, however, transcending the scope of any government bureau, and calling for the exercise of functions as broad as science itself. Such a case is represented by the establishment of the National Research Council. The immediate need for this body was indicated by the demands which the war has thrown upon the scientific men of other nations.

The individualistic tendencies of science in England are notably illustrated by the lives of Darwin and Faraday. Sprung respec-



BIG WORTHINGTON PUMP, 22,000 GALLONS



BIG BROOK AND HYDRAULIC RAM SERVICE

tively from the upper and the lower social strata, their careers were alike free from the influence of the schools. Both worked as individuals, unaided by organized effort; and both are typical of that marvelous succession of original thinkers and creators which Britain has given and still gives to the world. Her contribution to science is sufficiently indicated by the fact that out of the ten greatest names on the walls of the Institute, three—Newton, Faraday, and Darwin—are British.

But the slowness of England in calling science to her assistance in the present war is not chargeable to her investigators, nor to the great national societies which represent them. They saw from the outset the mistakes which had been made through the neglect of science by the government, and brought pressure to bear to remedy them. The fine flavor of classicism may be congenial to diplomacy, but under modern conditions of warfare the simple facts of science can be ignored only at heavy cost to the nation. Necessity, sharp and decisive, forced this view upon the government, and the men of science were at length called to the aid of the state. We shall see in the sequel what service they have rendered. For the moment let us return to our own province.

This war has proved, if proof were needed, that the predatory instincts of mediaeval times have not yet vanished from the world. Nations still exist whose policy of cold-blooded aggression knows no bounds except those set by expediency. When it seems reasonably safe to strike, they do not hesitate to annihilate everything that obstructs their path of conquest.

Under such conditions there is but one thing for possible victims to do. No sane man walks unprotected through the lion-haunted territory of British East Africa. The penalty for doing so has been vividly portrayed in Colonel Patterson's "Man Eaters of Tsavo." By the same token, no sane nation will remain unguarded, least of all a nation rich beyond all others and irrevocably committed to the aggressive dictum of the Monroe Doctrine. We have chosen to demand, and we have repeatedly proclaimed in no uncertain tones, that no European nation shall acquire a foot of territory in this hemisphere, even if it be more remote from us than Europe itself. Are we prepared to enforce this demand?

Believing it to be the duty of men of science to assist by every feasible means in strengthening the national defense, the National Academy of Sciences volunteered its services to the President on

the occasion of its annual meeting last April. Its purpose in doing so was not merely as a measure of military preparedness, but in recognition of the fact that the future welfare as well as the security of the nation depends in large measure upon its attitude toward science. Indeed, the words of Rogers, quoted at the opening of this address, admirably express the existing demand: "To secure a steady prosperity in the midst of the busy inventions and the rapidly expanding knowledge" of the European nations, we must utilize, as they are doing, "the advances of scientific and practical discovery." And in doing so, we must not always fix immediate commercial applicability as the criterion of successful research, but remember that "the abstract studies and researches of the philosopher are often the most beneficent sources of practical discovery and improvement." Thus we may extend to the needs of the nation the maxims applied by Rogers to the Institute of Technology.

The request of the President, addressed to the delegation which conveyed to him the offer of the Academy, called for immediate and vigorous action. He expressed the desire that the Academy should coördinate the scientific resources of the country and secure the coöperation of the many industries by which they are represented. And in doing so, he recognized and indicated the broad scope of the undertaking thus initiated.

An organizing committee, appointed forthwith, lost no time in beginning work. After securing cordial assurances of coöperation and support from the heads of government departments, scientific bureaus, national scientific and engineering societies, educational and research institutions, and industrial research laboratories, a plan of organization was formulated and laid before the council of the Academy on June 19. This plan recommended the establishment of a National Research Council, so constituted as to recognize and utilize scientific research in every field. It was seen from the outset that the activities of the council should not be confined to the promotion of researches bearing directly upon military problems, but that true preparedness would best result from the encouragement of every form of investigation, whether for military and industrial application, or for the advancement of knowledge without regard to its immediate practical bearing. The scheme of organization must be broad enough to secure the coöperation of all important agencies in accomplishing this result.

After considering a variety of plans, the Organizing Committee presented to the Council of the Academy the following recommendations:

That there be formed a National Research Council, whose purpose shall be to bring into coöperation existing governmental, educational, industrial, and other research organizations with the object of encouraging the investigation of natural phenomena, the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare.

That the council be composed of leading American investigators and engineers, representing the army, navy, Smithsonian Institution, and various scientific bureaus of the government; educational institutions and research endowments; and the research divisions of industrial and manufacturing establishments.

That, in order to secure a thoroughly representative body, the members of the council be chosen in consultation with the Presidents of the American Association for the Advancement of Science, the American Philosophical Society, the American Academy of Arts and Sciences, the American Association of University Professors, and the Association of American Universities; that representatives of industrial research be selected with the advice of the Presidents of the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers, the American Society of Electrical Engineers, and the American Chemical Society, and that members of the cabinet be asked to name the representatives of the various departments of the government.

That research committees of two classes be appointed, as follows: (a) Central committees, representing various departments of science, comprised of leading authorities in each field, selected in consultation with the president of the corresponding national society. (b) Local committees in universities, colleges and other coöperating institutions engaged in scientific research.

The Organizing Committee also recommended the following plan of procedure, subject to such modifications as the National Research Council may deem desirable:

(1) The preparation of a national inventory of equipment for research, of the men engaged in it, and of the lines of investigation pursued in coöperating government bureaus, educational institutions, research foundations, and industrial research laboratories; this inventory to be prepared in harmony with any general plan adopted by the proposed Government Council of National Defense.

(2) The preparation of reports by special committees, suggesting important research problems and favorable opportunities for research in various departments of science.

(3) The promotion of coöperation in research, with the object of securing increased efficiency; but with careful avoidance of any hampering control or interference with individual freedom and initiative.

(4) Coöperation with educational institutions, by supporting their efforts to secure larger funds and more favorable conditions for the pursuit of research and for the training of students in the methods and spirit of investigation.

(5) Coöperation with research foundations and other agencies desiring to secure a more effective use of funds available for investigation.

(6) The encouragement in coöperating laboratories of researches designed to strengthen the national defense and to render the United States independent of foreign sources of supply liable to be affected by war.

The Council of the Academy voted to accept the proposals of the Organizing Committee, and instructed it to proceed with the formation of the National Research Council in accordance with the plan recommended.

The endorsement of the President of the United States and the authority to secure the appointment of government representatives, is conveyed in the following letter to the President of the Academy:

WASHINGTON, D. C., July 24, 1916.

DR. WILLIAM H. WELCH,

President of the National Academy of Sciences, Baltimore, Md.

My Dear Dr. Welch:

I want to tell you with what gratification I have received the preliminary report of the National Research Council, which was formed at my request under the National Academy of Sciences. The outline of work there set forth and the evidences of remarkable progress towards the accomplishment of the object of the council are indeed gratifying. May I not take this occasion to say that the departments of the government are ready to coöperate in every way that may be required, and that the heads of the departments most immediately concerned are now, at my request, actively engaged in considering the best methods of coöperation?

Representatives of government bureaus will be appointed as members of the Research Council as the council desires.

Cordially and sincerely yours,

(Signed) WOODROW WILSON.

On August 5, with the assent of the heads of the several executive departments, the President appointed nine representatives of the government as members of the Research Council. He has since appointed two additional members from the navy department at the request of the chairman of the council, and will appoint others as the needs of the work may require.

In a large undertaking of this nature, it is necessary to have the coöperation of other academies and societies, both general and special, which are concerned with the development of scientific and engineering research. It is a satisfaction to state that the most cordial assurance of coöperation has been received from all

sides. The following resolutions, adopted by the Engineering Foundation, which is administered by the four great national engineering societies having an aggregate membership of thirty thousand, are typical of those subsequently adopted by the American Philosophical Society, the Marine Biological Laboratory at Woods Hole, the Franklin Institute, and other organizations:

WHEREAS: The National Academy of Sciences of the United States of America has taken the initiative in bringing into coöperation existing governmental, educational, industrial and other research organizations with the object of encouraging the investigation of natural phenomena, the application of scientific principles in American industries, the employment of science in the national defense, and such other objects as will promote the national welfare, and

WHEREAS: These objects are among the objects for which the Engineering Foundation was created. Now, therefore, be it

Resolved, That the Engineering Foundation hereby registers its approval of the coördination and federation of the research agencies of the country undertaken by the National Academy of Sciences and expresses its willingness to join with and assist the National Academy in accomplishing the above federation.

The Engineering Foundation has also voted to apply its entire income for the current year (including a special gift of \$5,000 for this purpose from its founder, Mr. Ambrose Swasey) toward the expenses of organization, to give the services of its secretary, and to provide a New York office for the National Research Council in the United Engineering Societies Building.

In addition to the American Association for the Advancement of Science, and the other bodies dealing with science as a whole which have already been mentioned, the special societies have shown an equal desire to coöperate with the council. In organizing committees dealing with questions of mathematics, physics, chemistry or any other department of science, the National Research Council has adopted the general policy of inviting the leading national society in that field to join with it in choosing the necessary committee, and in promoting its work. For example, in the case of the Committee on Nitrate Supply and the Central Chemistry Committee (which is organizing research in various branches of chemistry), the American Chemical Society is acting jointly with the National Research Council.

As already indicated, the work of the National Research Council involves the promotion of scientific research under three chief categories: the strengthening of the national defense, the development of American industries, and the advancement of knowledge.

In the first two of these fields, we may profit by a brief survey of the work which is now being done abroad by investigators engaged in the solution of problems raised by the war.

I have just returned from a short trip to England and France, where I went in company with Dr. William H. Welch, President of the National Academy, to learn how men of science can be of the most effective service under war conditions. The contrast with what I observed during a visit to Europe three years ago is a striking one. At that time the International Association of Academies, of which the National Academy of Science is the American representative, was holding its triennial meeting at St. Petersburg. For the delegates present national boundaries had ceased to exist, and the leaders of science from England, France, Germany, Russia, Italy, Holland, and other great nations were engaged in the consideration of the best means of promoting international coöperation in scientific research. Important projects for the development of the International Association of Academies, which might have led to a large extension of its activities, were under consideration. Berlin was selected as the next meeting place, and under normal conditions the triennial meeting would have been held there last May. But the war intervened. The men who were working together for the promotion of international science have necessarily turned their attention toward national problems, which will occupy their minds until the war ends. But not one of them has forgotten that science is after all an international matter, which should be promoted again from this point of view as soon as conditions permit. In spite of the narrowness and bitterness which a few representatives of science have shown, the great majority may be counted upon to exert their best influence in the future to secure a resumption of international relations as soon as circumstances may render them practicable.

The devotion to pure and applied science which the men of science and the engineers of all countries have shown in the past, is fully equalled by the enthusiasm with which they have thrown themselves into the solution of war problems. Recognizing, as they do, that their obligation to the state is fully equal to that of the men who have gone into the trenches, they have gladly put aside their ordinary pursuits for the purpose of concentrating their attention upon problems of national importance. The leaders in England are such men as Lord Rayleigh, Sir Joseph Thomson,

and Professor Arthur Schuster, all well known as physicists, and as leading officers of the Royal Society. Associated with them are many eminent investigators in various fields of science, such as Sir Ernest Rutherford, Professor Bragg, Sir Charles Parsons, Professor Starling, Sir Robert Hadfield, Sir Almroth Wright, and others as well known. In France we found an equally distinguished group, under the immediate direction of M. Painlevé, the eminent mathematician, now minister of public instruction. Associated with him in charge of the work of research are M. Borel and M. Perrin, distinguished in the fields of mathematics and physics. With them I found a group of investigators whom I have known for many years, including engineers, astronomers, physicists, mathematicians, chemists, physiologists, and men in other fields who have been gathered together from all parts of France. Thus M. Fabry has come from the University of Marseilles, M. Chrétien from the Nice Observatory, others from various centers of research in the provinces. To you who are familiar with the methods of research in pure science and engineering, it is easy to understand how these men have been able to drop their investigations in the observatory and laboratory, and turn their attention toward the solution of war problems. To the general public, which does not recognize that the astronomer is frequently engaged in investigations with the electric furnace or other apparatus closely similar to that employed in the manufacture of nitric acid or other explosives, or for the solution of other military and industrial problems, such a metamorphosis may be rather surprising. But experience has shown how readily the investigator can adapt himself to the solution of the problems which the exigencies of the moment may have thrust before him.

Thus we find Count de la Baume Pluvinel, the well known French astronomer, inventing an induction device which I saw in use at the hospitals at the front for finding pieces of shrapnel in the body. M. Chrétien is working on theoretical problems connected with the development of airplanes. Count de Noüys, whom I met in Dr. Carrel's hospital at Compeigne, has worked out a formula by which the time of healing of wounds can be predicted with great accuracy. The Duc de Broglie is busily engaged with naval problems. And so I might go on through a long list of other cases. I have particularly mentioned the work of three members of the old aristocracy, to indicate how heartily they have thrown themselves into the

task of defending the republic. This is merely a single illustration of how magnificently all elements in France have united for the common cause.

If time permitted, I might give you many illustrations from England of the similar work in progress there. I was naturally careful to avoid inquiring into any war secrets, regarding which I was not concerned. My object was to learn how engineers and men of science, with their minds open to the possibilities of improvements through research, can be of service to their country. Perhaps some illustrations which Sir Robert Hadfield, head of the great steel works at Sheffield, was kind enough to give me may prove of interest to this audience.

Not many years ago, when the perennial race between armor plate and projectiles was already well advanced, the case for the projectiles appeared to be a hopeless one. When fired from the most powerful gun, its hardened steel point merely splintered against the armor plate, and wholly refused to penetrate. Armor plate, as you doubtless know, is hardened only on its front surface. One day, on the proving grounds, a piece of armor was by chance set up in the wrong position; that is to say, its soft back was accidentally turned toward the gun. Greatly to the surprise of the observers, the projectile easily penetrated the plate. After it had been found that this could be repeated indefinitely, it occurred to some one to cover the hardened point of a steel projectile with a soft steel cap. When this was fired against the hardened steel face of armor plate the projectile passed through without difficulty, leaving fragments of the soft steel cap behind it.

This single illustration is typical of the innumerable opportunities for advance in every department of pure and applied science. Every student and graduate of the Institute, in time of war, would certainly wish to make the best contribution of which he is capable toward the defense of his country. But the most valuable assistance can be given now, in a time of peace. If weak and unprepared, we are liable to be attacked by any aggressive power that may covet our territory or that of our neighbors in this hemisphere. But if we solve some of the fundamental problems of preparedness, we are less likely to be molested, less exposed to crippling losses in case war should come. Thus mathematicians, chemists, physicists, geologists, biologists and engineers in every field can aid materially in preserving peace and in reducing the sufferings of possible war.

But how, you may ask, may they lend a hand? The answer is easy. Few of the problems to be solved are of a strictly military character. Take, for example, one which has been the subject of an exhaustive investigation by the National Research Council. At the request of the Secretary of War a strong committee, including in its membership three prominent representatives of the Institute, Dr. Noyes, '86 (Chairman), Dr. Whitney, '90, and Dr. Elihu Thomson of the Corporation, is preparing a report on the best utilization of the twenty million dollars appropriated by Congress for the fixation of nitrogen. From a military standpoint this matter is fundamental, as nitric acid enters into the manufacture of all high explosives. But in times of peace nitrates are equally important for the fertilization of the soil. The wise use of this appropriation is thus a question of great national significance, as it is well known that the yield of our farms could be enormously increased if an abundance of cheap fertilizer were available.

The Committee on Nitrate Supply has been fortunate in securing the cordial coöperation of many leading authorities and manufacturers, who have freely supplied information respecting the various processes. While some of these processes are in commercial use, the opinion is unanimous that through scientific research any existing process could be very materially improved. Specific investigations on catalytic agents and on many other factors, chemical and physical, which enter into the various processes, can be suggested by Dr. Noyes to any capable investigator who is prepared to deal with the subject. Research of this kind represents the best form of preparedness, applying equally to war or peace.

Sir Robert Hadfield's discovery of manganese steel, now so effectively employed for the helmets demanded by trench warfare, is another illustration of what can be accomplished by research. It was known that by adding 2 or 3 per cent. of manganese to iron, a very brittle alloy resulted. Sir Robert increased the proportion to about 14 per cent., and was rewarded by the production of a remarkable non-magnetic substance, of extraordinary toughness, which has found hundreds of applications in the arts. Similarly he produced his valuable low-hysteresis steel, employed so widely in electric transformers, by the use of a small percentage of selenium.

In the field of alloys alone the opportunities for progress are limitless. Our government is about to build rigid dirigibles, and

must have the lightest and stiffest skeleton bodies that can be constructed. Here is a chance for the experimenter. Germany has made great progress in this direction, and England has also accomplished much since the beginning of the war. But the field is still open, as the ideal alloy is yet to be produced.

The whole department of aeronautics is a fascinating one to the investigator. The Institute, thanks to the gift of Henry Morss, has set an example here which should be widely followed by other educational institutions. Through the provision of a wind-tunnel, with suitable auxiliary apparatus, valuable experimental work has been done by Lieutenant Hunsaker and by his successor, Lieutenant Alex. Klemin. In this connection the important part played by the mathematical physicist is admirably shown by the theoretical researches of Dr. E. B. Wilson.

At the request of Colonel Squier, chief of aviation, a member of the National Research Council, the council will coöperate with the National Advisory Committee on Aeronautics in promoting the investigation of aeronautical problems in educational institutions. Here again, it will be observed, the work accomplished will be no less useful in peace than in war. The council will soon publish a list of problems, to be prepared by Colonel Squier. This will prove of value to all who wish to engage in aeronautical research.

I might go on to mention the investigations which press for solution in the fields of ship design, steam and internal combustion engineering, preventive medicine, and in many other departments. But the cases I have cited will suffice to illustrate the nature of the work in view. Every Institute man will recognize from what has been said how closely some phase of this broad work must be related to his own daily occupations. He can assist in many ways: by taking part personally, or through associates or students, in some research which will be of service in strengthening the national defense; by aiding to secure a wider public recognition of the importance of science and especially of research in advancing our industries; by increased use of research in developing his own business, following the example of leading corporations; by gifts for the support of industrial research or research in pure science at the Institute or elsewhere; by the establishment of a Research Fellowship at the Institute, either in pure science or for industrial problems, following the plan of the Mellon Institute or that of

Yale University;* by suggesting important research problems to the committees of the National Research Council.

Additional information may be obtained by addressing the secretary of the council, 33 West Thirty-ninth street, New York. We are organizing committees on mathematics, physics, chemistry, geology, geography, preventive medicine and various other branches of science, in coöperation with the national societies in these fields. We are also forming committees on engineering and industrial research, in conjunction with the Engineering Foundation, which is conducted under the auspices of the national engineering societies. Thus the Research Council will soon be in a position to offer practical suggestions to anyone who may desire them. Problems bearing on the national defense, formulated by Admiral Taylor, Colonel Squier, and other members of the military section of the council, will be ready for distribution in the near future.

Within the limits of a single address it would obviously be impossible to enumerate any considerable fraction of the industrial problems which call for research. Take the question of dyestuffs where, as in many other fields, we are largely dependent upon Germany. If the serious problem of meeting foreign competition were already solved on the manufacturing and commercial side, there would still remain a great amount of research to be done before the manufacture of certain dyes could begin. For in many instances the processes have not been worked out here. Their essential details are known only in Germany, and must be independently discovered through the researches of our own chemists.

Another important case is that of optical glass. Through the aid of government subsidies, the firm of Schott & Company in Jena long since developed a remarkable series of glasses for optical purposes. Suddenly deprived of these at the outbreak of the war, and compelled to provide optical glass in large quantities for field-glasses, gun-sights, periscopes, range-finders and other instruments, England was forced to take immediate action. A series of investigations, undertaken by Professor Jackson of Kings College, London, and Dr. Rosenhain of the National Physical Laboratory, has already led to excellent results, but much remains to be done. France, which manufactured more optical glass than England before the war, has also made great progress. In this

* An annual contribution for one or more years enables the Research Fellow to attack any problem the donor may wish to have solved.

country we should institute similar investigations, as this is a case, like that of nitrates or dyestuffs, where it is hazardous to be dependent upon foreign sources of supply.

Quite apart from war or its effects, the development of our industries through scientific research is of the greatest importance to the nation. The financial value of research is fully appreciated by our great corporations, which are held up by the British Advisory Council of Scientific and Industrial Research as examples which their manufacturers must follow if they would compete with us effectively. The American Telephone and Telegraph Company, the General Electric Company, and the Westinghouse Company, respectively represented on the National Research Council by Dr. Carty, Dr. Thomson and Dr. Whitney, and Dr. Skinner, have shown in their laboratories what progress can be made by industrial research. But it is especially significant to note the attitude of these industrial leaders toward research in pure science.

When inviting me to make this address, President MacLaurin particularly asked me to refer to the importance of pure science in the Institute. He recognizes fully, as President Rogers did so long ago, and as the industrial leaders I have just mentioned so emphatically point out today, that industrial progress must depend directly upon the progress of pure science. Many investigations may advantageously be undertaken with immediate practical ends in view. But to use a commercial criterion as a measure of the value of all research would be a fatal error, since it would inevitably result in the loss to the world of the greatest discoveries in science. Marconi's development of wireless telegraphy would not have been possible without the prior work of Hertz, the physicist, who detected in his laboratory the electric waves which Maxwell's mathematical investigations on the electromagnetic theory of light had led him to predict. Carty delights in telling how his marvelous feat of telephoning without wires from Washington to the Hawaiian Islands was the direct outcome of researches in pure physics, made without thought of application in the arts. Pasteur's great contributions to medicine were the result of his studies of the optical properties of the crystals of tartaric acid, undertaken for no other purpose than to advance our knowledge of physics and chemistry. Even a science like astronomy, so often looked upon as of merely theoretical interest, is of fundamental importance to human progress. Poincaré has explained, in his

book *La Valeur de la Science*, how the initiation of research in every field of knowledge was stimulated by the discoveries of the ancient astronomers, and how undeveloped all branches of science would still be if we lived in a world perpetually surrounded by clouds.

Thus any form of scientific research, whether for the advancement of knowledge, the development of our industries, or the strengthening of the national defense, should be recognized as a valuable service to the public. The appreciation of this view by President Rogers was a dominant factor in the establishment of the Institute. Here in these new laboratories, when scientific research has been developed as far as available funds will permit, and when the wisest balance has been established between pure science and its applications, the Institute will set an example which the entire country would do well to follow. Taken as it stands, the original plan of President Rogers for the Institute also serves to define many of the most important possibilities of the National Research Council. May we not count, therefore, upon a close coöperation between the Institute and the Council, in the hope that both may thus benefit in the advancement of their common aim—the larger utilization of science for the welfare of the nation?

GEORGE E. HALE, '90.

G. A. Gardner Dead

Mr. George Augustus Gardner, noted philanthropist, died August 7 at the age of eighty-seven.

Mr. Gardner under the name of "Mr. Smith" gave \$10,000 one winter and \$8,000 the next to provide employment for needy men in laying out parks. All his life he made liberal donations to Boston charities.

Mr. Gardner had served in many directorates, including the Old Colony Railroad, the Boston and Providence Railroad, the Boston and Lowell Railroad, the Massachusetts Bank, the Merchants' National Bank, the Massachusetts Hospital Life Insurance Company, the Provident Institution for Savings, the Amoskeag Manufacturing Company, the Lawrence Manufacturing Company and the Massachusetts Cotton Mills. He also was a member of the Corporation of the Massachusetts Institute of Technology.

INDUSTRIAL ORGANIZATION OF ALUMNI

Personnel Index Census of all Tech men suggested—How it would be of service to the National Government under conditions of peace or war—Technology to blaze the way

That Technology will play an important part in the industrial organization of the United States for National Defense is shown by the appointment by the President of two prominent M. I. T. alumni to positions of the highest distinction.

Dr. George Ellery Hale, '90, whose astronomical research work at the Mount Wilson Solar Observatory has given him an international reputation has been made chairman of the Research Committee of the National Academy of Science. This committee has made plans for the introduction of research work in this country on a scale comparable only with that of Germany.

The other appointment is that of Hollis Godfrey, '98, to the Advisory Council of National Defense. Dr. Godfrey was born at Lynn, Mass., April 27, 1874; took his Ph. B., at Tufts College in 1895 and received an honorary Sc. D. from Tufts in 1912. He was graduated at the Institute of Technology in 1898. He married Mary Lawrence of Boston, September 11, 1895. He was head of the department of science at the School of Practical Arts, Boston, 1906-10 and practiced as consulting engineer between 1910-12; was chief of the Bureau of Gas in the reform administration of Philadelphia, 1912-13, and has been president of the Drexel Institute since 1913. He is a fellow of the Royal Geographical Society, member of A. S. M. E., A. S. C. E., senator of the Phi Beta Kappa, and member of the National Institute. His chief work has been the application of the principles of science in a sane and practical way to the large problems of business government and education, and for a remarkable success in popular education along scientific lines. His "Elementary Chemistry" in 1909 and "The Health of the City" in 1910 are his principal published works, in addition to a series of capital boys' stories.

On October 11 President Wilson took the first step to organize the Council of National Defense. He appointed the seven civilian members of the Advisory Board of the Council as follows: Daniel

Willard of Baltimore, president of the Baltimore and Ohio Railroad; Samuel Gompers of Washington, president of the American Federation of Labor; Dr. Franklin H. Martin of Chicago; Howard E. Coffin of Detroit; Bernard Baruch, the New York banker; Dr. Hollis Godfrey of Philadelphia; Julius Rosenwald of Chicago, president of Sears, Roebuck & Co.

In announcing the appointments, the President issued the following statement:

"The Council of National Defense has been created because the Congress has realized that the country is best prepared for war when thoroughly prepared for peace. From an economic point of view there is now very little difference between the machinery required for commercial efficiency and that required for military purposes. In both cases the whole industrial mechanism must be organized in the most effective way. Upon this conception of the national welfare the Council is organized, in the words of the act, for 'the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the nation.'

"The organization of the Council likewise opens up a new and direct channel of communication and coöperation between business and scientific men and all departments of the Government, and it is hoped that it will, in addition, become a rallying point for civic bodies working for the national defense. The Council's chief functions are:

"1. The coördination of all forms of transportation and the development of means of transportation to meet the military, industrial and commercial needs of the Nation.

"2. The extension of the industrial mobilization work of the Committee on Industrial Preparedness of the Naval Consulting Board. Complete information as to our present manufacturing and producing facilities adaptable to many-sided uses of modern warfare will be procured, analyzed and made use of.

"One of the objects of the Council will be to inform American manufacturers as to the part they can and must play in national emergency. It is empowered to establish at once and maintain through subordinate bodies of specially qualified persons an auxiliary organization composed of men of the best creative and administrative capacity, capable of mobilizing to the utmost the resources of the country.

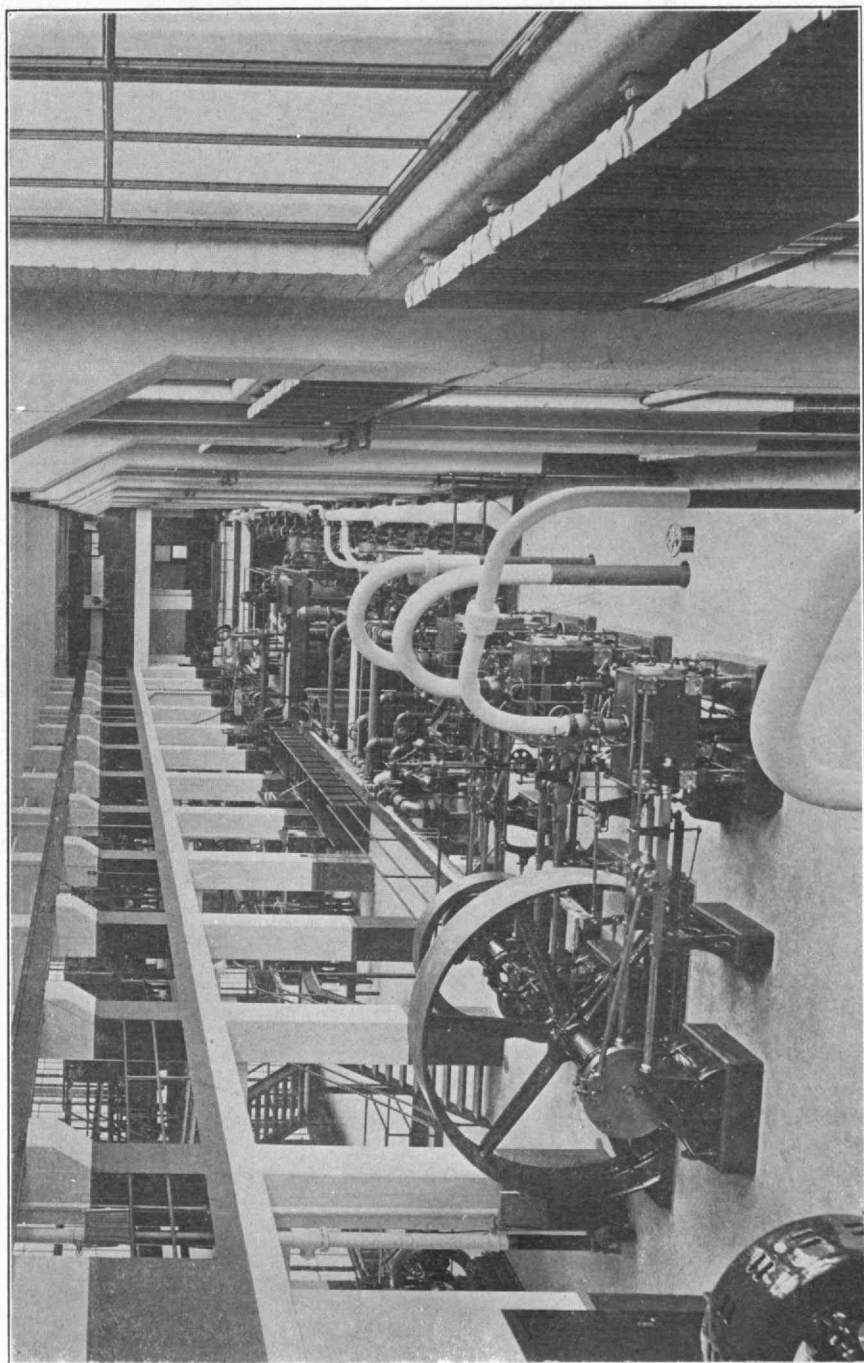
"The personnel of the Council's advisory members, appointed without regard to party, marks the entrance of the non-partisan engineer and professional man into American governmental affairs on a wider scale than ever before. It is responsive to the increased demand for and need of business organization in public matters and for the presence there of the best specialists in their respective fields. In the present instance the time of service of some of the members of the Advisory Board could not be purchased. They serve the Government without remuneration, efficiency being their sole object and Americanism their only motive."

So that the exact scope of the Council may be fully grasped, the following parts of the National Defense Law passed last summer are given. The law states:

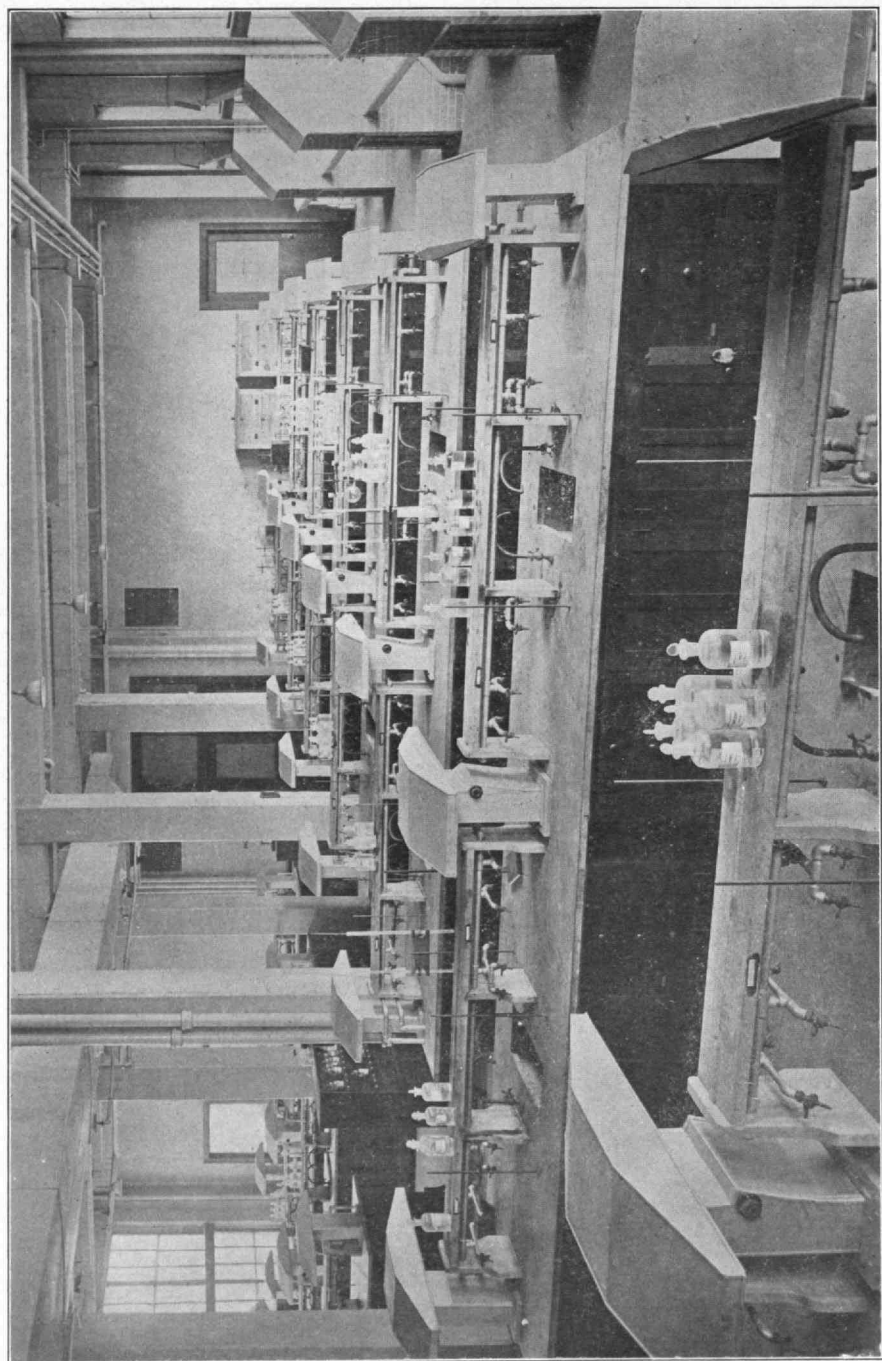
SEC. 2. That a council of national defense is hereby established, for the coördination of industries and resources for the national security and welfare, to consist of the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, and the Secretary of Labor.

That the council of national defense shall nominate to the President, and the President shall appoint, an advisory commission, consisting of not more than seven persons, each of whom shall have special knowledge of some industry, public utility, or the development of some natural resource, or be otherwise specially qualified, in the opinion of the council, for the performance of the duties hereinafter provided. The members of the advisory commission shall serve without compensation, but shall be allowed actual expenses of travel and subsistence when attending meetings of the commission or engaged in investigations pertaining to its activities. The advisory commission shall hold such meetings as shall be called by the council or be provided by the rules and regulations adopted by the council for the conduct of its work.

That it shall be the duty of the council of national defense to supervise and direct investigations and make recommendations to the President and the heads of executive departments as to the location of railroads with reference to the frontier of the United States so as to render possible expeditious concentration of troops and supplies to points of defense; the coördination of military, industrial, and commercial purposes in the location of extensive highways and branch lines of railroad; the utilization of waterways; the mobilization of military and naval resources for defense; the increase of domestic production of articles and materials essential to the support of armies and of the people during the interruption of foreign commerce; the development of seagoing transportation; data as to amounts, location, method and means



STEAM LABORATORY FROM SOUTH GALLERY WITH CORLISS TRIPLE EXPANSION



LABORATORY OF ANALYTICAL CHEMISTRY

of production, and availability of military supplies; the giving of information to producers and manufacturers as to the class of supplies needed by the military and other services of the Government, the requirements relating thereto, and the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the Nation.

That the council of national defense shall adopt rules and regulations for the conduct of its work, which rules and regulations shall be subject to the approval of the President, and shall provide for the work of the advisory commission to the end that the special knowledge of such commission may be developed by suitable investigation, research, and inquiry and made available in conference and report for the use of the council; and the council may organize subordinate bodies for its assistance in special investigations, either by the employment of experts or by the creation of committees of specially qualified persons to serve without compensation, but to direct the investigations of experts so employed.

That the sum of \$200,000, or so much thereof as may be necessary, is hereby appropriated, out of any money in the Treasury not otherwise appropriated, to be immediately available, for experimental work and investigations undertaken by the council, by the advisory commission or subordinate bodies for the employment of a director, expert and clerical expenses and supplies, and for the necessary expenses of members of the advisory commission or subordinate bodies going to and attending meetings of the commission or subordinate bodies. Reports shall be submitted by all subordinate bodies and by the advisory commission to the council, and from time to time the council shall report to the President or to the heads of executive departments upon special inquiries or subjects appropriate thereto, and an annual report to the Congress shall be submitted through the President, including as full a statement of the activities of the council and the agencies subordinate to it as is consistent with the public interest, including an itemized account of the expenditures made by the council or authorized by it, in as full detail as the public interest will permit: provided, however, that when deemed proper the President may authorize, in amounts stipulated by him, unvouchered expenditures and report the gross sums so authorized not itemized.

One of the first requirements of the Council of Defense will be to have a personnel index of those citizens who could be of service to the Government in the industrial organization of the country in time of emergency. It has been clear from the experience of England, France and Germany that the civilian population which works to keep the Nation in food, clothing and supplies, as well as the armies and naval arms supplied with their necessities, is as important as the combatant forces.

Believing that Technology alumni would wish to be in the forefront of this movement, Dr. Godfrey has suggested that an index of all Tech men be prepared giving the complete record of every former student at the Institute.

This Technology index is to be a perpetual inventory of the work done by every Tech man, this inventory to be kept up to date by additions every six months. It may be said to be composed for every man of two parts. Part I—A summary of what was done up to January 1 or July 1 of the current year. Part II—The statement of the six months prior to the last semi-annual division.

It is believed that it is most important for the country to know in this time of great change and advance in engineering and in industry, not merely what a man does, but what he did last; not merely his general line, but also what specific thing he knows best. For example, in twelve thousand listed alumni, two hundred may be entered as concerned with bridge construction. That fact would appear cross indexed in the personnel index, showing the available bridge building brain of Technology. But such general statements are not enough to give immediate results. Our two hundred bridge builders may have been, probably have been, judging from the habits of Technology, building bridges all over the world. Some have been spanning the Rio Grande, some have been struggling with ice in Alaska, some may well have been working in the zone of fire on the other side. We may at least assume that fifty different problems of soil, of nature, of transportation of raw material, of climate and the like have been met by our two hundred engineers of design and of construction.

In the index it is Part I that shows the training and experience that prepared the man to do the work of the last six months and brought him to the beginning or to the middle of the current year. It is Part II which records the problem of which he knows the most. So when the time comes that a bridge builder is needed in tropic sands or in northern snows, the call goes to Tech for the man or men best fitted for the specific job. And the job picks the man. The statement that the work is bridge building brings out immediately the file of bridge builders. The statement that the work is in tropic conditions, with motor truck transportation, with shifting soil, with other similar limiting factors enables exact selection of those men who have been meeting and solving similar conditions.

Looking forward it is not too visionary to see the day when

every trained man will be listed in the great personnel index begun at Technology—when the call having come to our college will go to all the others and that group of men best fitted to do any job may be called for that job in the shortest space of time. An ideal condition it is true, but an obtainable ideal, and the obvious value of such a personnel index of technical men in every branch of industry and scientific pursuit will appeal to all those who believe in organization and specialization.

To be prepared industrially to play its part in the great commercial struggle which is bound to come after the close of the war, the United States must also prepare itself for defense in any emergency. Dr. Godfrey's plan of a civilian personnel index will be the first step taken in this country to organize a group of trained specialists in such a way that their complete qualifications would be instantly available to the government. Other educational institutions have already promised Dr. Godfrey cordial support and will organize in a similar manner as soon as the preliminary technique of attack has been worked out through Technology, and gradually there will be acquired by the National Council an index of industrial and scientific experts who could handle any problem with the least loss of time and efficiency.

A committee of the Alumni Council has been appointed to report on the plan and it is hoped that all the alumni will assist in making the Institute a leader in this great work. There can be no question that in this plan lie vast possibilities of science to the Nation and to Technology. The development within our own body of the technique of attack, the common application of our own training to so great a plan of organization and of specialization will do much for the Nation, for the college world and for ourselves. It is a concept filled with the spirit of Technology and we may well conceive the shade of William Barton Rogers looking down upon this plan and saying, "It is well done. Once more the meaning of *Mens et Manus* is made evident to the world."

LESTER D. GARDNER, '98.

ROGERS' CREED AND OUR DUTY

Technology should organize for more efficient research work in order to fulfill President Rogers' great plan—Real Preparedness and the Institute's part in it

The great Pageant which was the crowning feature of the Dedication-Reunion last June taught a profound lesson. Alma Mater, with her attendant Liberal Arts, was denied her throne until Righteousness had coöperated with Will and with Wisdom to subdue the wild forces of Nature and the still wilder ones of untamed Man. The vast industries of the United States, in the awakening and ordering of which the Institute of Technology has played so conspicuous a part, will prove in the end mere blind forces making for national destruction, unless they are permeated through and through with the spirit of righteousness, with the determination, that is, to use their stupendous power, not alone to enrich their promoters, but also to serve the state and to uplift mankind.

As a primary source of these rapidly growing industries, the Institute has duties far transcending that of supplying the market with young men technically trained in the sciences and arts. It has the greater task of sending those youth out into the world imbued with a sense of social responsibility, with an understanding of genuine citizenship, with a determination to put their talents, directly or indirectly, at the service of the state. To accomplish this, the Institute must itself be all the time contributing to new, fundamental knowledge, must itself be a willing and eager servant of the Nation, must itself emphasize the fact that it holds its funds in trust and for the sole purpose of promoting in every possible way the common weal.

The Institute has advanced so far in fifty years because this spirit of social responsibility has, from the beginning, animated the institution and all those connected with it. That this is so is due in large measure to the fact that Technology had as its founder William Barton Rogers, who was at once a profound student, an inspiring teacher, a skilful organizer, and a man with what may properly be called a passion to be of service to mankind. He was

a genuine prophet, and he left behind him a body of educational and social doctrine which has served and which should always serve as the Institute's moral foundation. Most fortunately, moreover, he summed up this body of doctrine in a real educational creed. In 1860, he published his "Objects and Plan of an Institute of Technology," and in that pamphlet, among many other wise things, is found this comprehensive declaration of faith:

"We believe . . . that the most truly practical education, even in an industrial point of view, is one founded on a thorough knowledge of scientific laws and principles, and which unites with habits of close observation and exact reasoning a large general cultivation. We believe that the highest grade of scientific culture would not be too high as a preparation for the labors of the mechanic and manufacturer; and we read in the history of social progress ample proofs that the abstract studies and researches of the philosopher are often the most beneficent sources of practical discovery and improvement."

Here in one short paragraph are laid down the three things most essential to the enduring success of the American people: (1) an education which "unites with habits of close observation and exact reasoning a large general cultivation"; (2) the basing of all industry upon sound scientific knowledge; and (3) the promotion of comprehensive scientific research. Were the people of the United States to be really educated to exact thinking and wide understanding; were their vast industries to be carried on in the light of applied science instead of in the obscurity of rule-of-thumb; and were there among them a large, instead of a comparatively small, body of men and women intelligently seeking new truth, the future of the Republic not only would be assured, but would be successful beyond the wildest imaginings of the Utopians.

While, for the rank and file of a nation of one hundred millions, this creed of President Rogers is a counsel of perfection, for a picked body of scholars it should be the accepted rule of action. The Institute, during its first half-century, had many valid reasons for living up to this creed only imperfectly and in part; during its next fifty years it must make this "we believe" of its eminent founder a brilliant actuality. It has the prestige, it has the physical facilities, it has the eager men, both within and without its walls, and it can have the money needed to give to its students a broad, as well as an intensive, training, to take an active and inti-

mate share in promoting the national industries, and to be the leader in bringing to a high pitch of efficiency every possible department of research. In short, Technology has right before her the opportunity of taking, if she chooses to do so, a foremost part in that movement for national and industrial preparedness, the necessity for which has been made, by the terrible events in Europe, patent to even the most indifferent eye.

To grasp this opportunity—one of the greatest that is ever likely to come to her—the Institute should organize in the most efficient way the research side of her work, offering the widest possible opportunities not only for seasoned investigators to continue, but also for picked young men to begin, studies in pure and in applied science that are certain to be of the highest importance to society. The Institute should use every proper means, moreover, of allying itself with the industries both of Massachusetts and of the country as a whole, helping to organize them scientifically to meet the tremendous exigencies certain to follow the war. And as a necessary part of this work it should take a census both of its own facilities and of the capacity of its past and present students, gathering these data in such form, and keeping them so up to date, that they may be of instant service, whenever and wherever needed, to the state and to the Nation.

The question of research must be solved largely within the Institute itself, for it is a Faculty problem with whose difficult details the Faculty alone are competent to deal. But the alumni can assist to the extent of helping to secure the needed funds, and of bringing to the Faculty those problems which, in the experience of the "man on the job," seem to demand immediate research.

In the matter of putting the Institute into closer relation with industry, the alumni must be, of course, the direct medium; for it is they who have direct access to the manufacturing and business world, and who have the opportunity of seeing at what points the Institute can serve the industry, and the industry can serve Technology.

As to the census, this must be largely an alumni undertaking; and, fortunately, the M. I. T. Alumni Association has so far perfected its machinery of organization that there is needed only enthusiasm and concentration, together with such coöperation as was so splendidly shown at the time of the Reunion, to make this census substantially complete and almost immediately serviceable.

It should show what every alumnus has done in research, in invention, or in the application of science to industry; should indicate what he is planning to do further along those various lines; and should register what he is able and willing to do for national preparedness, both in normal times of peace, and under the special stress of possible war. Such a census will be not only immensely valuable in itself, but will also serve, it is hoped, as a model for other associated bodies of men, so that, with the spreading of the idea, there will soon be at the service of the Federal Government a body of information of incalculable use.

Human history since July, 1914, has taught many lessons; and possibly the gravest to the United States is that, notwithstanding its favored position and its non-militaristic habit of mind, it may at any time, and unexpectedly, find itself at war. Experience has shown that under those conditions it is the young men of the best traditions and the highest education who are first to volunteer. This being the case, it is for the Institute to give grave consideration to the way in which Technology is fulfilling its obligation to provide military training in return for an annual grant from the Federal Government. Should we be satisfied with what is being done and, within its limitations, so admirably done; or should we devise some further means of preparing young men who, in event of war, are certain to be among the first to go to the front, for this high duty? Precious lives will be lost, but none should be taken because of ill preparation. Those young men should go to the test of battle armed not only with modern weapons, but with that technical military knowledge and that seasoned experience which seemingly can be in large degree given in advance of actual war, and without which, as the experience of our own Civil War showed, so many are needlessly destroyed.

These four problems,—that of research, that of closer coöperation with the industries, that of making an "industrial preparedness" census, and that of considering the development of military training—are to be the immediate concern of all the alumni organizations during the coming year. Every group of Tech men, whether large or small, should give thought and work towards their solution. If we pull together we can take great strides even in six months; and only by this coöperation among the alumni and between them and the Institute authorities can Technology assume

that new leadership which is properly hers, leadership in making industrial preparedness not a mere matter of academic discussion, but an actual, living fact in American life.

JAMES P. MUNROE, '82.

Our Duty to the National Government

The Alumni Council at its November meeting voted to appoint a committee for the purpose of assisting, as far as possible, two important committees of the government that are taking account of our human resources.

Because of the organization of Technology alumni, it was decided to ask us to take up the matters in question, in order to blaze the way for other colleges and technical schools. If Technology has a duty to the National Government it is a duty not only for the Institute and the alumni body, but for every local alumni association, every class, and every individual alumnus. The movement started by the Alumni Council will be nation wide and will be the subject of discussion and suggestion wherever Tech men come together.

The subject suggested for the annual meetings of all associations is "Technology's Duty to the National Government." Under this general subject there will be two subdivisions: "Technology and Research," and "Trained Minds for the Future Problems of the Nation." Not only will this subject be taken up for active discussion in local centres, but it will be taken up by classes at their meetings, and in each class there will be a special committee to assist the committee to be appointed by the Council. The general discussion of this matter will be of great value in itself. Many of the specific suggestions of Tech men will undoubtedly be of direct value; and the census to be taken, together with the answers to the questionnaire which is to be sent out, will be of direct service to the Government, and the successful carrying through of the enterprise will reflect credit upon Technology. It is hoped that influence may be brought to bear on friends of the Institute to equip it with funds so that a systematic research on a large scale can be carried out in its new laboratories.

The Association of Class Secretaries voted at the last meeting that the January REVIEW should be principally devoted to this general topic.

COUNCIL TAKES IMPORTANT ACTION

Dr. Hale, '90, and L. D. Gardner, '98, suggest ways in which Technology can assist the National Government—To be basis of work of Alumni this winter—Valuable results expected

The first fall meeting of the Alumni Council, held at the Engineers Club, October 30, was one of unusual interest, and if the suggestions of the speakers who addressed the Council are carried out Technology will play a very important part in practical preparation for the future of this country.

During the salad course Secretary Humphreys of the Alumni Association was called upon to tell about the Convention of Alumni Secretaries which he recently attended in Nashville.

One matter of business brought before the meeting was the suggestion that the business year of the association, which now coincides with the calendar year, should be changed to cover the school year. A number of the alumni saw advantages in this plan. There were some disadvantages connected with it and it was shown that it might be necessary to change the constitution in some respects if the plan was adopted. Mr. Emerson moved that the idea of making the fiscal year of the association coincide with the school year be approved by the Council and that the working out of the change be left in the hands of the Executive Committee of the association. This motion was carried.

In introducing the speaker of the evening, Mr. Stone, president of the Alumni Association, referred to a recent utterance of President Maclaurin suggesting some important matters upon which Technology could work in the future. These were directly in line with the subjects to be discussed.

The first speaker was Dr. George E. Hale, '90, director of the Mount Wilson Solar Observatory, Pasadena, Cal., and chairman of the National Research Council, which has recently been appointed by the National Academy of Sciences, at the request of President Wilson.

Dr. Hale described the organization of the National Research Council, tracing the history of the National Academy of Sciences back to the early part of the Civil War, when it was formed, at the

request of the Government, to assist in grave national problems. In order to prosecute the work of the National Research Council, the Engineering Foundation is devoting its entire income to the work of the Council, and Mr. Swasey of Cleveland has given an extra \$5,000. Dr. Hale emphasized the need of extending the research at the Institute of Technology, with its improved facilities, and its increasing importance in the scientific world. It should be a pioneer not only in prosecuting research but in stimulating it throughout the country. He spoke especially of the value of research in pure science, which in his opinion was not given sufficient attention. The speaker outlined some of the ways in which the Alumni Association could assist his committee and the national Government in promoting investigation and in securing information from its members.

President Stone said that the whole question of national defense was a very broad one, a question that was affecting the entire world. Competition at the present time is keener than it ever was before. The conditions to be met after the war are fully as important as the measures for national security and defense. In the problems before the country, research is one of the most important items to be considered for the success of the Nation. Applied science and commercial research are obviously, directly beneficial, but we need more pure scientific research, as suggested by Dr. Hale, if we are to take our place among the nations of the world. There is another side to the question, also, and that is in connection with practical means for defense. He called upon Lester D. Gardner, '98, as one of the first men who became interested in the Plattsburg Training Camp, and publisher of the magazine *National Defense*.

Mr. Gardner said that during the past year he had attended many meetings upon defense and preparedness. Most of the speakers he had heard dealt largely with generalities. In Philadelphia last week at a convention of physicians and surgeons he had seen an example of how a profession could organize itself for the service of the country with the greatest efficiency. A census of the physicians and surgeons who might be called in case of war is being taken, emergency hospital bases are being located and all the matters that would be pertinent in time of war are being considered in all details. This is an indication that the work of preparation for a crisis has gone beyond the preliminary stage and is now

being crystallized into practical shape. The thing that interests us as Tech men, however, is that in looking ahead to conditions that would have to be met by men of the highest type of ability, two of the high places have been given to Tech men, to Dr. George E. Hale, chairman of the National Research Council; and Dr. Hollis Godfrey, president of the Drexel Institute of Philadelphia, who has been appointed by President Wilson, as one of the seven members of the Advisory Commission to coöperate with the National Council of Defense. The National Council of Defense was created by the Hay Bill as was also the Advisory Commission. Dr. Godfrey has been engaged in this work of preparedness for over a year and a half, aided by expert assistants, in order to facilitate the organization of the industrial resources of the United States. The National Council of Defense will represent the Government as the repository of all information that will be collected from the industrial organizations of the country for use in case of future war.

Three days after Dr. Godfrey had been appointed on that commission he consulted with Mr. Gardner as to how Technology could help the national Government. His plan includes the organization of the brains of the country as well as the industrial resources. It will be necessary to have experts in every line of endeavor, not only in case of a future war, but in order to be of benefit in developing the country in time of peace. The speaker believed with Mr. Godfrey that Tech could do a great work along these lines and suggested that a committee be appointed to start the movement among the alumni. The field of the National Council of Defense was like a similar organization in England.

He quoted the following from the National Defense Act:

"That it shall be the duty of the Council of National Defense to supervise and direct investigations and make recommendations to the President and the heads of executive departments as to the location of railroads with reference to the frontier of the United States so as to render possible expeditious concentration of troops and supplies to points of defense; the coördination of military, industrial, and commercial purposes in the location of extensive highways and branch lines of railroad; the utilization of waterways; the mobilization of military and naval resources for defense; the increase of domestic production of articles and materials essential to the support of armies and of the people during the inter-

ruption of foreign commerce; the development of seagoing transportation; data as to amounts, location, method and means of production, and availability of military supplies; the giving of information to producers and manufacturers as to the class of supplies needed by the military and other services of the Government, the requirements relating thereto, and the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the Nation."

At this point the President read a letter from M. L. Emerson, '04, written in April, suggesting that the Alumni Council take up the matter of preparedness in all its phases, with reference to offering the assistance of Technology to the Government in case this became desirable. The letter was not acted on in the spring because of the importance of the impending Reunion.

I. W. Litchfield, '85, made a motion which was carried, as follows:

"That in the opinion of the Council, Technology should assist as far as possible in promoting research and in securing such information as may be of service to the national Government along the lines suggested by Dr. Hale and Mr. Gardner, and that a committee of four be appointed by the chair to make recommendations at the next meeting of the Council."

In supporting this motion Mr. James P. Munroe, '82, said that he felt that this was the most important matter that had been brought before the Council for years. Dr. Hale had called our attention to the fact that President Rogers founded the Institute not primarily as a training school but fundamentally as a means of applying science for the good of the country as a whole. Rogers felt that the salvation of the Nation would be through young men educated to find out the secrets of nature and then applying them to the uses of mankind. "We are now getting back to fundamental things," said Mr. Munroe. "The Institute must forge ahead along new lines, and with its present facilities it should become the leader in the new movement. It is the thing for Technology to do. It should devote its facilities to the fundamental problems of science, organizing research, and making it more effective." The speaker also referred to other phases as presented by Mr. Gardner. We should know all the resources of our alumni, so that they could be adapted to the country's needs in time of stress. We should urge on the Corporation and the Faculty the vast importance of extending research. It might be that this very enterprise would

be of assistance in securing more endowment, not only for research but for general purposes. If Institute men cannot contribute for this purpose they are at least in touch with wealthy men who might become interested. In considering this point a committee should be appointed to take charge of this matter, and the various plans for preparation, so far as the alumni of the Institute are concerned, should be carried on coöperatively.

Mr. Fay suggested that a census of Tech brains, spoken of by Mr. Gardner, is what the Alumni Association has desired for a long time, not only as a military measure but as an industrial measure. The proposed census might become a nucleus for an employment bureau, which would fill a long felt need.

Mr. Litchfield spoke of the interest that Technology men would naturally have in the proposed movement and of the effective service that might be given by them. The patriotic activity of the alumni body would react upon the association and the Institute in a most beneficial way.

Ralph H. Howes, '03, president of the Technology Club, New York, thought that the alumni might assist the military instructors at the Institute to make the course more attractive. The Plattsburg Camp was so attractive that the men both young and old attended with enthusiasm, and he thought we might succeed in doing the same with the undergraduate military exercises.

Dr. A. A. Noyes, '86, a member of the National Research Council and chairman of the Committee on Nitrate Supply, said that there would be many ways that the scientifically trained man might assist the Government. He spoke of the work of his own committee and the problem that would confront the country in case the supply of Chili saltpeter should be cut off by war or by the cessation of shipping facilities from any cause. It is estimated that we use one half million tons of nitrate each year. The nitrate is not only a vital military need, but is also required by our agricultural interests. It is essential for the efficiency of the country that we secure cheaper sources of nitrogenous fertilizer. The committee of which he is chairman was created for the purpose of investigating the best methods of securing this supply, and an appropriation of \$20,000,000 was made to be available in the event of the adoption of the plans of the committee. The National Academy of Science had been requested to appoint a committee, and that committee had been created not only among the members of the

academy but among chemists and engineers who were not members, among them a number of Tech men. This committee found serious problems of great magnitude. He said that he hoped that the committee would be able to make a report in a few weeks. The first essential was to secure an estimate of the military need, assuming that the foreign source of nitrate were cut off. Another question was, what amount of nitrogenous fertilizer would be necessary for the needs of the country at various prices at which it might be produced. He said that it is estimated that if the farmers could be supplied with nitrogenous fertilizer at the same price the German farmers were paid before the war, the yearly crops of the country would be a billion dollars greater.

Everett Morss, '85, said that he was also interested in preparedness, with the other members of the Council. There was one special feature, however, that interested us all, and that was the preparation for December 31, 1916. Up to that time Mr. Smith's offer of \$5 for extension of buildings, for every \$3 otherwise contributed to the endowment held good; that we had only a half million to go, and he said that the Corporation needed a little assistance. They hope to get fifty men at \$10,000 each, and he made a special plea for suggestions of names of men who might come into this class.

The committee appointed by President Stone to make recommendations at the next meeting of Council consists of I. W. Litchfield, '85, James P. Munroe, '82, Raymond B. Price, '94, and Merton L. Emerson, '04.

Tech Clubs Associated to meet in April

The Technology Club of Northern Ohio has invited the Technology Clubs Associated to meet as its guest in Cleveland in April, and the days set are Thursday, Friday, and Saturday, April 19, 20 and 21. This comes during the spring vacation at the Institute when, it is hoped, a number of the professors can attend. The Technology Club of Northern Ohio has already organized and made a program covering the three days. The committee is determined to make the coming meeting the most remarkable that the associated clubs have ever held.

ABOUT THE MOVING PICTURES

After many delays 6,000 feet of film is being edited—Secretaries of Associations will be notified when ready

Many Tech men are unquestionably wondering where the moving pictures are which were taken at the time of the Technology Reunion. To these men some explanation may be due, and I am going to try to give it.

When the question of moving pictures was taken up, it was considered advisable to employ a commercial moving picture man to take them, and steps were made towards the employment of such a man. The amount of money which was available for such a purpose was more or less limited, and it was found that only about 500 feet of film could be obtained for the appropriation which the committee felt was available for the work. Five hundred feet of film with captions would run only about ten minutes; and when it is remembered that the stunts at the beach, not to mention the parade of the classes, took hours rather than minutes, one can readily see that 500 feet of film was practically useless.

The whole matter was in the air until Mr. Walter Snow, '82, suggested that Mr. Frank B. Gilbreth, a consulting management engineer of Providence, using moving pictures in his business, might perhaps, owing to his great interest in Tech, take these pictures for us. The chairman of the photograph committee, Mr. Dempsey, '88, saw Mr. Gilbreth and made the arrangements, so that these pictures should be taken at no expense to the Institute. This arrangement made, difficulties cropped up all along the line. We had bad weather which interfered with many of the pictures. We had interference of all kinds from spectators, Tech men and others, so that it is a wonder that any pictures at all were taken of the laying of the Walker Memorial corner-stone, the various affairs at the beach, and the final dedication. But pictures were taken in spite of all the difficulties, and over 6,000 feet of film were either exposed or destroyed in the process. Three moving picture cameras were constantly at work in order to avoid if possible anything escaping from the camera. The views covered pictures taken on the boat from New York to Boston, exposures being

made up to as late as 8 o'clock in the evening; the meeting of the steamer by the squadron under Admiral Morss off Boston Light; the trip up the harbor; the meeting of the boat at the wharf; the laying of the corner-stone of the Walker Memorial; views of Technology and of the basin; the trip down the harbor; views on the beach; and later the dedication exercises.

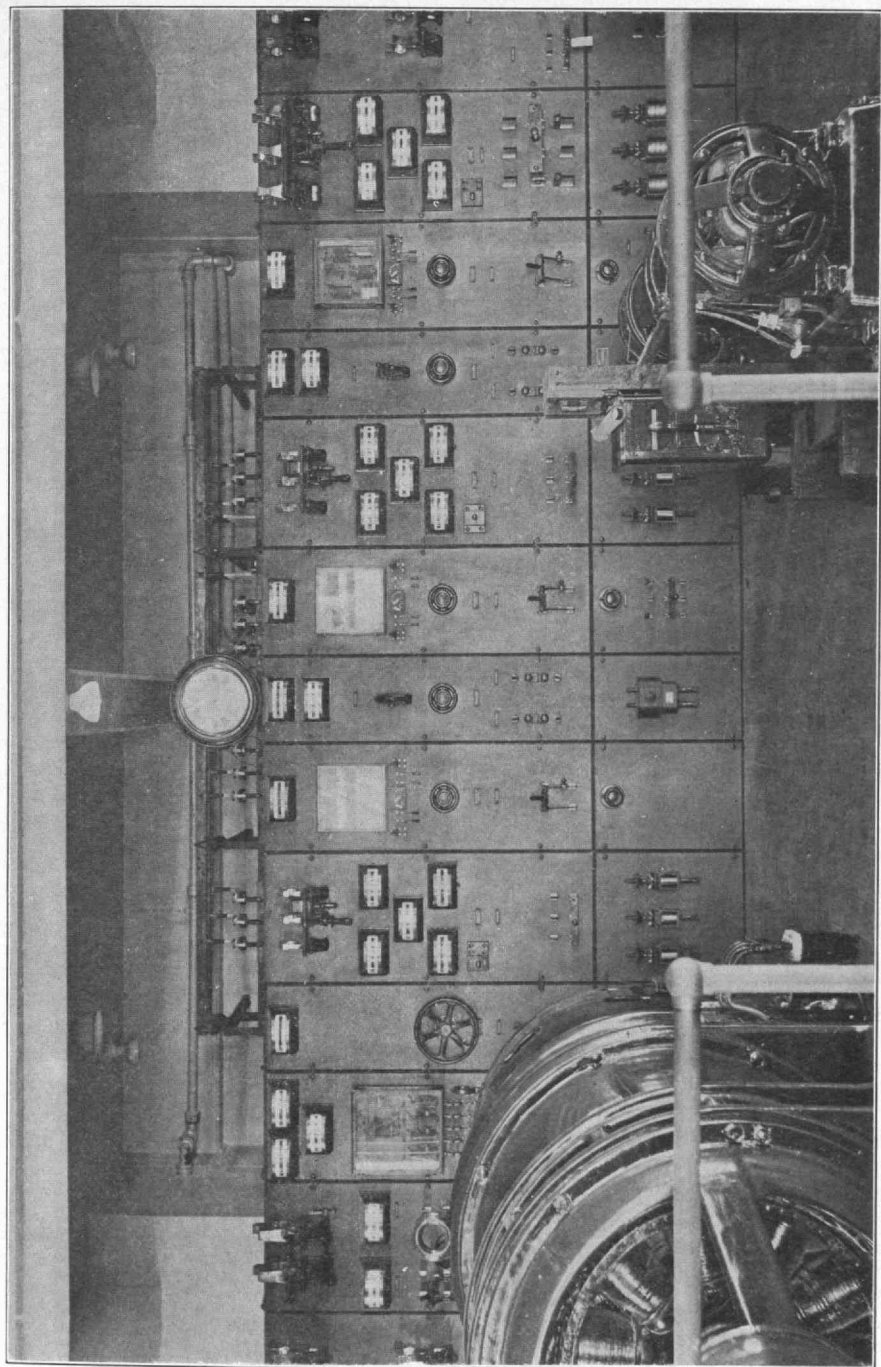
The pictures were developed and ready for criticism, arrangement and titles a very few days after the Reunion, but as the men selected to make suggestions were very busy at that time it was impossible to have the films shown properly at Mr. Gilbreth's place in Providence, so an attempt was made to see them at a small auditorium in Boston. The room was not large enough to properly focus the pictures and nothing was accomplished at that time. On account of the difficulty of getting the committee together Mr. Gilbreth put the films together and captioned them as well as he could.

There were two sets; one of them was sent to the Technology Club of New York, and the other to a moving picture bureau in Boston. Both of these sets were lost by the express company and it was over six weeks before they were recovered.

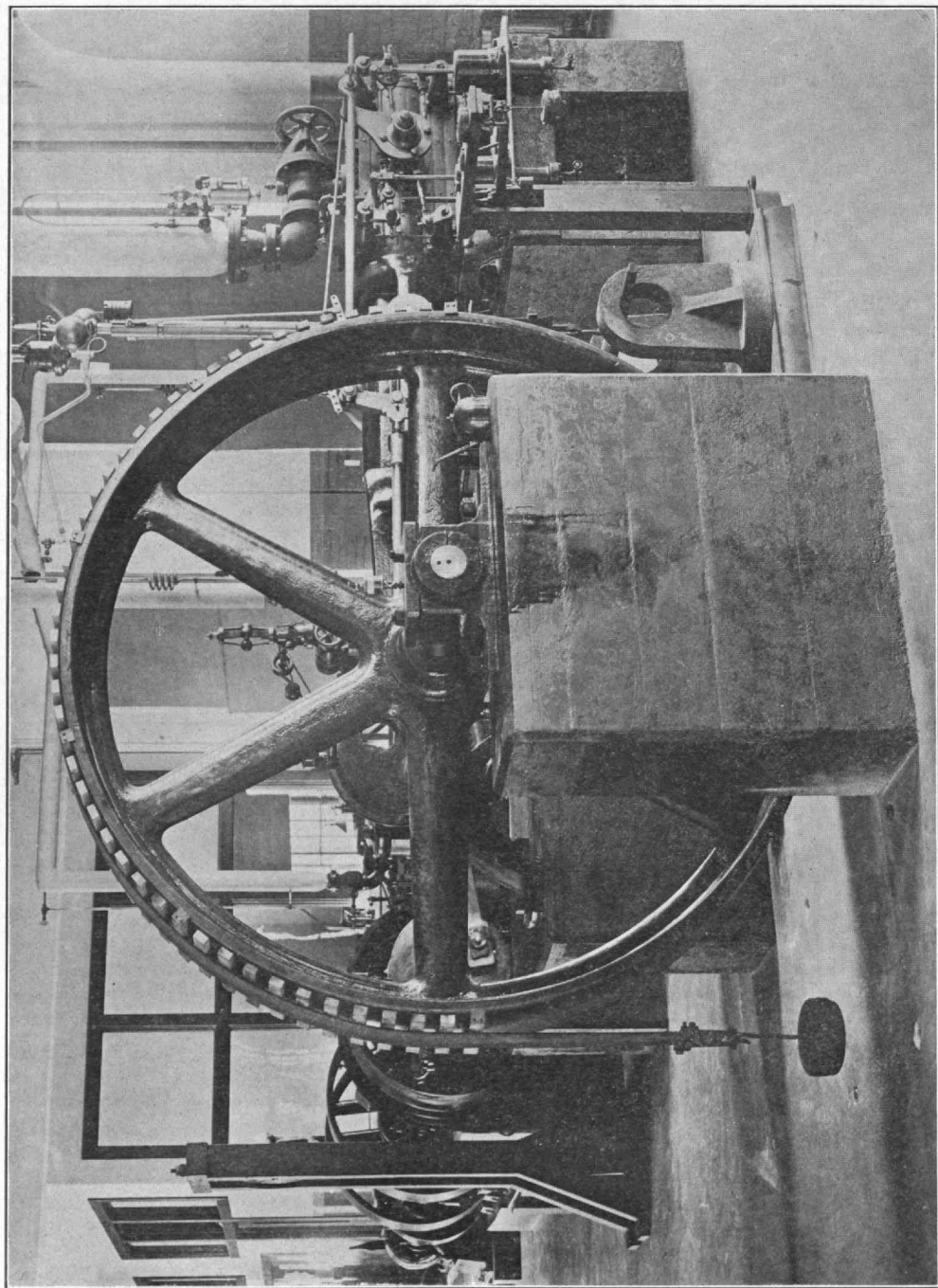
The film contained everything that was taken, good, bad, and indifferent, and it took two hours to show it. Inasmuch as some of the pictures were taken in the rain and in bad light, and, as in many cases, it was impossible to get suitable locations for the camera, it was decided to cut out about half the film, rearrange, and recaption it. We are now working to arrange the pictures in chronological order so that they will be understandable, and follow the proper sequence. Mr. Gilbreth is working with all his energy with me to accomplish the desired results, and we hope in a very short time to have the arrangement accomplished and be able to recall to the alumni all the principal features of the great Reunion of last June.

It is only fair to say that Mr. Gilbreth's work has been practically without return and he is entitled to the hearty thanks of every Tech man who has the opportunity of seeing the pictures.

HENRY D. JACKSON, '97.



SWITCHBOARD IN ELECTRIC LABORATORY



CORLISS ENGINE WITH FRICTION BRAKE

A MASTER'S COURSE IN CHEMICAL ENGINEERING

Describing a striking advance in technical education—A potential factor in the Research Work at the Institute

The greatly increased facilities for both instruction and research afforded by our new buildings on the Charles make possible the execution of a number of plans for improvement which have been under consideration at the Institute for some time. Of these none is more important than a new master's course in chemical engineering, including a School of Chemical Engineering Practice, which is now fully organized.

It is unnecessary to rehearse to the readers of *THE REVIEW* the rapid rise, within the last decade, of chemical engineering as a profession. The curve of progress has turned even more sharply upward since the beginning of the European war, and the recognition of the importance of the chemically trained man in industry grows more generous every day.

The current journals are full of pertinent articles on the urgent necessity of preparedness—both military and industrial—and we need here but call attention to the fact that while the economic conditions which must obtain when the war is over are still unknown to us, there will under any condition be a most urgent call for men to maintain that place in the world's industry and commerce which the United States is now rapidly assuming.

To meet this demand there must be provided men of the broadest possible training. They must be well grounded in science, trained in the application of its principles to daily problems, have acquired engineering points of view and angles of approach, and have developed business perspective with relation to chemical industries. In short, there must be produced the potential chemical engineer. When a man has acquired a solid foundation in science, has become an accurate observer, an exact and logical thinker, and has developed a love for the application of this knowledge to the investigation and solution of the many problems which industrial practice presents, he has done marvelously well; but he still lacks much that goes to make the successful chemical engineer.

While it is true that the resourcefulness in applying theory to practice, the training in the solution of industrial problems, the general business perspective and self-reliance, which in time complete the man's education and make him a creative engineer is obtained in its entirety only by years of experience, there is much which other engineering branches have accomplished to render more quickly available the scientific education of the embryonic engineer. Without well-equipped mechanical and electrical laboratories it would be a long and difficult step to pass from the small apparatus and light load of a physics laboratory to the heavy responsibilities of a power plant. But in operating and testing the commercial-sized units with which mechanical engineering laboratories are easily equipped, a measure of self-confidence and an appreciation of responsibility are obtained not otherwise possible. In addition to all this the student translates for himself the fundamental principles of physics as exemplified in the laboratory into the application of these same principles in units and processes of commercial size and value.

But analogous facilities have never been available for instruction in chemical engineering. The important and oftentimes controlling difficulties inherent in carrying on a chemical process on a manufacturing scale, are not present when this same process is conducted in a chemical laboratory. To duplicate the apparatus which has been designed and built for factory operation is possible, and in many cases well worth while. But in order to study its performance the apparatus must be operated—a process for which it was designed must be carried out. This procedure is obviously expensive and at best limited in its scope. A student cannot acquire the self-reliance necessary to operate a high pressure digester holding 25,000 gallons of acid by experimenting upon one of a few liters capacity. He cannot learn how to meet difficulties incident to handling a filter press, an electric furnace, a multiple-effect evaporator, a rotary kiln, and so on, if he has access only to such apparatus as the laboratory can provide. That experience which means power to execute comes only from contact with commercial-sized apparatus operating under the conditions imposed by practice.

Neither can the student obtain that training in the application of the principles of science to the problems of chemical industry on which successful industrial research so largely depends, without

an opportunity to live with chemical processes which are being conducted on a large scale. It is true that the research chemist must be able to visualize the hitherto unaccomplished fact, but, on the other hand, the undreamed accomplishments of the future, while using methods and equipment now unrealized, will also undoubtedly, to a large extent, employ the apparatus and the processes of today, although along new and varied lines. A familiarity with what does and does not succeed in present practice is the best foundation for that soundness of judgment so essential in every research worker, and most especially in those who are to direct and guide the activities of our industrial research laboratories.

In view of the difficulty of developing the type of engineer outlined without greater breadth of method and of contact than is possible in our educational institutions alone, it is generally recognized that the industries themselves have a duty to perform in this regard, and that without their coöperation educational accomplishment must remain imperfect. On the other hand, no satisfactory scheme involving industrial coöperation with educational institutions has hitherto been proposed, and the conception and inauguration of such a scheme cannot but represent an educational advance of the first order. Within the last few years a comprehensive plan of great promise for the more adequate training of chemical engineers along these lines has been originated by Mr. Arthur D. Little, '85, a member of the Corporation of the Institute of Technology, and chairman of the Visiting Committee for the Department of Chemistry. The plan has been enthusiastically adopted, and is based upon the idea of a close coöperation between the Institute and certain selected manufacturing organizations in representative industries. It involves radical changes in the Institute curriculum for chemical engineering, and the location of a part of the Institute's instructional activity in the manufacturer's plant. As Mr. Little points out in his report to the Corporation of the Institute, "any chemical process on whatever scale conducted, may be resolved into a coördinated series of what may be termed 'unit-actions,' as pulverizing, mixing, heating, roasting, absorbing, condensing, lixiviating, precipitating, crystallizing, filtering, dissolving, electrolyzing, and so on. The principles underlying each of these unit-actions are the same, however different the materials operated upon may be. Thus in a gas absorbing system, the laws of countercurrent

absorption which control the action of an ammonia scrubber do not differ from those involved in making sulfite digester acid. The number of these basic unit operations is not very large and relatively few of them are involved in any particular process. The complexity of chemical engineering results from the variety of conditions as to temperature, pressure, concentration, etc., under which the unit-actions must be carried out in different processes, and from the limitations, as to materials of construction and design of apparatus, imposed by the physical and chemical character of the reacting substances. It is possible to so select a relatively few industries that there will be represented by them all of the important unit-actions of chemical industry."

Experience has shown that when proper provision is made, the performance of a piece of apparatus may be studied without materially interfering with its output. Thus the principles of multiple-effect evaporation or of countercurrent lixiviation can best be understood by making properly designed tests upon a working plant involving these unit-actions. In other words, it is possible, under careful regulation, to use a manufacturing plant as a chemical engineering laboratory, and not cut down its production or influence adversely the quality of product. Some of the advantages of such a method of engineering practice over a laboratory equipped only for instruction, are:

1—A first-hand knowledge of the machines with which the plant is equipped, operating under conditions imposed by practice, the processes involved being considered as unit-actions; the factors which control their efficient performance; and a general knowledge of the cost of chemical apparatus in its relation to cost of installation and operation.

2—A study of the unit operations of the plant and the process which is being carried on, as examples of the application of the principles of science to industry; their interpretation in terms of physics, chemistry and mechanics.

3—A general knowledge of modern methods of factory management and control, obtaining thereby some familiarity with the problems presented by the human element in industry.

4—The education which comes from taking part in the work of the plant; in acquiring some degree of self-confidence in handling industrial processes and large sized apparatus.

To carry into execution Mr. Little's idea, a School of Chemical

Engineering Practice has been organized, which will increase in scope as experience is acquired. For the present it consists of five stations selected to furnish opportunity in specific fields of broadest general importance in chemical engineering. Each station will include a small instructional laboratory, drafting room, and conference room and will be provided with a projection lantern, such special library, drawings and models as may be needed. It will be in charge of a director, who will be a member of the Institute Faculty.

STATION A—Located with the Eastern Manufacturing Company, Bangor, Maine. Hugo H. Hanson, S. B., M. I. T., for three years chemical director of the Pulp and Paper Plant of the Berlin Mills Company at La Tuque, Quebec, will be the director, and Wilfred A. Wylde, S. B., M. I. T., formerly with the American Cotton Oil Company, assistant director. Here will be studied:

(1)—That most important application of the principles of electrochemistry to reactions taking place in solution, namely, the decomposition of common salt, with the formation of hydrogen, caustic soda and chlorine. The unit operations here available for study are electrolysis, multiple-effect evaporation with separation of a crystalline precipitate, caustic soda purification and concentration; absorption of gas of low partial pressure; agitation of both heavy and light liquids; and sedimentation of sludge.

(2)—The manufacture of bleached spruce pulp by the sulfite process. This is a high pressure-temperature reaction under careful analytical control, which involves most interesting equilibria.

(3)—The manufacture of poplar pulp by the soda process. In this process a study of the losses of soda through the cycle of operations is a most instructive one. It involves precipitation, sedimentation, filter press separation, systematic lixiviation and washing, and a determination of the soda lost in furnace flue gases by the Cottrell electrostatic separation principle.

(4)—The boiling, bleaching, and beating of rags for paper stock, and the manufacture of bond and ledger paper. This is both beater and tub sized, and is partly drum and partly loft dried. The opportunities for chemical engineering study here are obvious.

STATION B—Located at Everett, Mass., with the New England Gas and Coke Company. Guy H. Buchanan, A. M., W. & J.,

S. B., M. I. T., formerly head of the research laboratory of the New Jersey Zinc Company, will be director, and William B. Leach, Jr., S. B., M. I. T., since graduation connected with the Koppers Company, builders of by-product coke ovens, assistant director. Without going into detail, the opportunities here offered are readily appreciated. The company operates large by-product coke ovens and water-gas plants, with all the apparatus incident to the recovery of naphthalene, benzol, toluol, tar, ammonia, etc. Every opportunity is here presented to study those high temperature reactions of hydrogen with various hydrocarbons which have become so important in recent years.

STATION C—Located at Niagara Falls with the Carborundum Company. Ernest W. Wescott, A. B., Harvard, Ph.D., M. I. T., of the Institute Research Laboratory, director, and Winthrop E. Caldwell, S. B., M. I. T., for three years with the American Writing Paper Company, assistant director. High temperature electrochemistry is here represented in all its phases. Powerful electrical furnaces of both the resistance and arc types are in operation making a variety of products. The apparatus for pulverizing, with accurate separation, is here seen at its best, systems of sieving and screening, hydraulic classifying, and pneumatic separation being in constant operation.

STATION D—Located at Stamford, Conn., with the American Synthetic Color Company. Leslie T. Sutherland, S. B., Cornell, for a number of years director of the Research Laboratory of the Royal Baking Powder Company, will be director, and Edwin S. Wallace, B. A., Wittenberg College, M. A., Ohio State University, formerly with the Aetna Explosives Company, assistant director. At this plant will be studied the chemical engineering of organic chemistry. Fractional distillation, sulfonation, alkali fusion, nitration, reduction, crystallization, with all the necessary apparatus, are but a few of the operations here available.

STATION E—Located near Allentown, Pa., with the Atlas Portland Cement Company. Samuel S. Salisbury, Jr., M. S., Lehigh University, now assistant professor of Industrial Chemistry at Lehigh, will be director, and John S. Little, S. B., M. I. T., formerly of the E. I. du Pont Powder Company, will be assistant director. Large scale operations involving crushing and grinding in many types of machines are here offered. The chemistry

of combustion and furnace control is nowhere studied to better advantage than in the mammoth kilns of this plant.

To obtain the greatest good from such splendid opportunities it is clear that this school must be a part of a consecutive and consistent course of study. Not only must an adequate scientific foundation be laid before undertaking this chemical engineering practice, but provision must be made for taking advantage of the directness of purpose and enthusiasm for further scientific study which the factory work will create. This is accomplished by providing a master's course in chemical engineering of five years' duration, including the entire summer between the fourth and fifth years. The first three years are identical with those of the four-year bachelor's course in chemical engineering as now offered at the Institute. At the end of the third year the student will elect either to finish the regular course of four years, receiving therefor the bachelor's degree, or to spend two years and the intervening summer in study and receive both the bachelor's and master's degrees. From those students who elect this master's course, including the School of Chemical Engineering Practice, the Faculty will select those whose attainments and character, as shown by their previous record of scholarship and by other information, are such as to indicate that the course can be creditably pursued.

At the middle of the fourth year the men so selected will be divided into five groups, and one group sent to each of the five stations for a period of six weeks. (Experience may prove that this is too short a time to accomplish the greatest good.) At the end of each six-week interval the groups will change stations, so that by September 1 each group will have occupied each station. After from three to four weeks' vacation these men will all return to the Institute for the fifth year of advanced work—graduating the following June. It must be kept in mind that the students going out into these industries do not go as employees of the industry, but as students in the School of Chemical Engineering Practice. It is intended that the work in the plant shall be wholly educational and the men are to be under the control and direction, not of the plant organization, but of the director of the station—a member of the educational staff of the Institute. While it is intended to give the men as much industrial experience as possible, having them take shifts in the ordinary routine of the factory, such work

will be directed throughout to secure the maximum educational result, and the interpretation of the experiences and results of work in the plant will be accomplished by conference and drawing room exercises which will take up no small fraction of the time spent in each station. It is expected in this way to avoid the weakness and inefficiency of previous schemes of coöperation by making no attempt whatever to have the student an economic asset to the industry, but planning his whole activity for its educational return to the student himself. An educational feature of great potential value to the industries which we shall hope to develop at these stations, and for which their equipment will be especially well adapted, is a type of extension course for the benefit of the foremen and selected employees. In these courses will be taken up the theory of the processes employed, and a study of the plant from the point of view of current practice in analogous industries. It is believed that these courses will react for greater efficiency not only among the employees, but the students making up the school.

To secure this high educational efficiency from the contact of the student with the industry, it will be noted that the student has completed substantially the equivalent of a four years' course in chemical engineering before entering the School of Practice. This will make possible the full appreciation of the significance of every fact and the interpretation of every experience in the light of fundamental principles.

The work of the fifth year is advanced in character, broad in scope, and almost wholly elective, the purpose being to take advantage of the student's enthusiasm and to allow him to specialize in the line in which he has found by experience that he has the greatest aptitude and interest. He may elect advanced science courses and devote himself to research in this field, or he may devote his time more largely to the application of scientific principles to engineering practice.

But the plan is a coöperative one, and while it is confidently expected that in the work carried on by these students entirely for its educational value, there will result an accumulation of data, much of which will be of service to the industry concerned, yet this prospective return is not figured as an asset of the plan. As a return for the use of the factory as a chemical engineering laboratory the Institute proposes to establish and direct for each Company concerned, a research organization devoted entirely to the

solution of its individual problems. While a laboratory will be maintained at each station, the extensive research facilities of the Institute will be available for work of a special character, and the Faculty of the Institute will function as a consulting staff.

The earning power of industrial research is now too firmly established to require any argument to demonstrate the possibilities for coöperative service which the plan possesses. It is earnestly hoped that in it may be found an effective method by which science may be more closely linked to industry, for the lasting benefit of both.

WILLIAM H. WALKER.

Fellowship for Asphaltic Research

With the coöperation of Harvard University and the Massachusetts Institute of Technology, the Barber Asphalt Paving Company has established at these institutions a fellowship for research in asphaltic materials and their uses. The fellowship is to be known as "The Clifford Richardson Fellowship." Mr. Richardson, an alumnus of Harvard, has made many contributions to asphaltic highway construction and to the chemistry of bitumens.

The appointment of the incumbent of the fellowship and the choice of subjects for investigation, as well as the disposition to be made of the results of such investigations as may be undertaken, are to be decided by the Institute Faculty or the joint committees of the University and the Institute having control of engineering work.

Annual Alumni Dinner January 6, 1917

Please take notice that the annual dinner of the Alumni Association of the Institute will take place at Hotel Somerset, Saturday evening, January 6, 1917. The general subject of the meeting will be "The Development of Technology Resources for Peace and War." The subject will be discussed by speakers particularly qualified and, in view of the campaign of the Alumni Association for the purpose of assisting the national government in its campaign for preparedness, the occasion will be an interesting one.

CHEMICAL RESEARCH AT THE INSTITUTE

Its relation to the new Five-Year Course in Chemical Engineering—The nomenclature of research discussed

The appearance in this issue of the REVIEW of two comprehensive articles on the importance of scientific research in the development of our national welfare, and the active campaign among the alumni in the interests of research which is about to be inaugurated, make opportune a short discussion of the relation which exists between this vital part of the Institute's work and the new five-year course in chemical engineering this year offered for the first time.

In current articles on national preparedness, a distinction continues to be frequently made between so called pure research and applied research. This is unfortunate in that there still clings to the term "pure research" the erroneous idea, that only when the investigation is far removed from those points of contact with every day life and affairs which make for usefulness, is it intellectually enjoyable, broadly educational and nobly altruistic. Such is not the case. As has frequently been pointed out by others, scientific researches differ only in the motives which actuate them;—that is, whether the work be undertaken with a desire to make a contribution to science through free and generous publication of the results, or whether the new knowledge acquired be carefully guarded as a private possession.

It may be safely assumed that no research has ever been pursued at the Institute, or is likely to be undertaken which does not contain the promise of sometime being helpful to some one. Work of such a character that its only justification is the "mental pleasure" of the one engaged in it is a form of selfishness not in keeping with Institute traditions. In President Rogers' plan there was no place for an Institute activity, the ultimate ideal of which was not service to the community.

It is true that research on industrial problems in manufacturing organizations all too easily becomes unidirectional. The work is in fact a direct attack for the purpose of attaining a definite end. No observation made or phenomenon encountered can be followed up, however interesting it may appear, unless it obviously bears

directly upon the immediate problem. The investigator's attention is so fixed upon the goal of his endeavors that he fails to recognize important relations as they appear. This is an unfortunate consequence of the pressure incident to commercial life, and such work is of necessity fragmentary rather than fundamental. But research may be undertaken for immediate utility and still be fundamental in its method and results. Witness the splendid work of Langmuir in the Research Laboratory of the General Electric Company,—of the greatest value to science and yet at the same time of wonderful utility. In other words, the fact that a research contains the possibility of being helpful to some one as soon as published should not render it thereby any less "pure" than if it were assumed that the results will never be useful. The only distinction in research which is serviceable is between fundamental, thorough research for the ultimate good of the community, and commercial research which is carried on for the personal benefit of the individual. But even this latter type of research is not without its benefits to the public, for sooner or later any advance in science, however secret it may have been made, will redound to the advantage of the public.

However, the two essential factors in research of any kind are financial support and men capable of directing the work. Of these two it is generally considered that the former is the more difficult to obtain. Such however is not always the case. It is now, and possibly may continue to be, easier to get the funds necessary to carry on a scientific investigation, than it is to find a man with the ability and training required to plan and execute the work. This ability can best be acquired by the man just graduated through the pursuit of advanced studies in science, and working under the guidance of men already versed in the methods and means of successfully conducting a scientific investigation. Assuming on the part of the student a sound scientific foundation, his immediate need is the opportunity and incentive to devote his time and energy to research.

It is obvious, therefore, that with the greatly increased facilities which the new buildings afford, the Institute must not only take an ever increasing part in the broad field of scientific investigation, but it must provide a mechanism by which our ablest graduates will be led to return for advanced study and research, instead of going directly into industrial practice. Under the pressure of modern

life the average student feels the necessity of capitalizing his education, and at the end of four years at the Institute is anxious to "get to work." It is the most common experience, however, to later receive from our graduates the assurance that an additional year of science and research would have added greatly to their efficiency, and hence to their capacity for work. Two agencies may be utilized in influencing able men to pursue advanced work at the Institute after finishing the four-year course. First, a course of study for an additional year or years may be offered so obviously valuable that men of ability will be attracted to it. Second, an opportunity may be provided for the student to realize through his own personal experience in factory work, the power possessed by the man who has a thorough knowledge of the principles of science and a training in the application of these principles to the problems of the hour, and to learn, more accurately than he can do in any other way, the demands which will be made upon him by the modern progressive manufacturing organization.

We believe that both of these possibilities have been utilized in the new master's course in chemical engineering. Concerning what may be called the undergraduate portion of this course, the query may arise, why make chemical engineering a preparation for research work.

Upon analysis it is apparent that the type of undergraduate training for research does not differ materially from that required of any scientific man going out into the activities of modern life. The spirit which is the basis of scientific research is also the spirit of constructive, progressive endeavor in any line of work. On the other hand, the man who is to devote his time exclusively to scientific investigation may very easily become narrow and inefficient through a lack of knowledge and an interest in the application of science to the basic problems which confront the industries. Moreover, there is a method of attack and a point of view acquired by a study of engineering subjects which is lost by those men who pursue a strictly "pure science" course. It is our opinion that a judicial introduction of fundamental engineering conceptions and engineering practice into the science courses is essential to that comprehensive outlook and sympathetic appreciation of the problems of industrial life which makes for the greatest service—however rigidly the student may subsequently apply himself to science wholly removed from its application. No one can determine with

certainty in what field he will ultimately spend his life. The man of science with no conception of engineering methods is by this fact and to this extent limited in the possibilities for usefulness which life holds out for him. Therefore this course aims to provide for a training of sufficient breadth to produce either the potential research director as above outlined, or the creative chemical engineer according to the kind of work the graduate finds he is best fitted for and most enjoys.

WILLIAM H. WALKER.

Co-op's Profits Jump

Gross profits for 1915-16 amounting to \$83,662.90, as compared with \$75,179.01 a year ago, are announced in the annual report of the Harvard Coöperative Society. The report shows total sales for the fiscal year 1916 of \$445,391.45 as compared with \$411,400.40 in 1915, including the business done by the branch store.

Profits show an increase of \$8,483.89. The sum of \$18,644.61 is available for distribution in dividends to members, or for additions to the society's regular surplus. A year ago the amount so available was \$15,202.84. The directors have recommended and the stockholders have declared a dividend of 9 per cent. on all cash purchases made by members and a dividend of 7 per cent. on all credit sales. The total amount to be paid in dividends this year is \$16,614, an increase of \$1,538 over the amount paid a year ago. Dividend checks will be ready for members about the middle of October.

At the invitation of the Technology authorities and by arrangement with the Technology Coöperative Society, which now goes out of existence, a branch store of the Harvard Society was opened this autumn on Massachusetts avenue directly opposite the new Technology buildings. Students at the Institute are now eligible for membership in the Harvard Coöperative Society and nearly 1,600 men have joined since the opening of the college year. Sales at the Technology branch thus far have exceeded expectations, amounting to nearly \$25,000 in the first week. Tech members will receive whatever dividends this branch store may earn.

NOMINATING COMMITTEE REPORTS

List of candidates for officers of Alumni Association and term membership on the Corporation with brief sketches

Nominations for officers of the Alumni Association and term membership on the Corporation have been reported by the Nominating Committee, and ballots will go out November 20. The polls will close in Boston, December 20. Following are the nominations: For president (one year), Francis R. Hart, '89; vice-president (two years), Morris Knowles, '91; secretary-treasurer (one year), Walter Humphreys, '97; members of the executive committee (two years), George L. Gilmore, '90, Alexander Macomber, '07; for representatives-at-large on the Council (two years), Z. W. Bliss, '89, T. D. Brophy, '16, C. W. Goodale, '75, F. W. Lovejoy, '94, C. F. W. Wetterer, '06; for term membership on the Corporation (five years), Charles G. Hyde, '96, Elisha Lee, '92, John L. Mauran, '89, Frank H. Page, '85, Edward W. Rollins, '71, Willis R. Whitney, '90.

The three names receiving the largest number of votes will be submitted to the Nominating Committee of the Corporation.

Following are sketches of the candidates:

Charles Gilman Hyde, '96. Graduate in sanitary engineering. Professor of sanitary engineering and acting dean, College of Civil Engineering, University of California; Consulting sanitary and hydraulic engineer. Residence: Berkeley, Cal.

For four years assistant and assistant engineer with the Massachusetts State Board of Health, Boston; two years at Philadelphia, Pa., as assistant engineer and assistant engineer-in-charge of water purification studies; three years at Harrisburg, Pa., as resident engineer-in-charge of Testing Station, designs and construction of water purification and low-lift pumping works; 1905 to date, consulting engineer on many water supply, water purification, sewerage and sewage treatment problems and works for cities, public and private institutions, and industrial plants, mainly in California; for three years special consulting hydraulic engineer, Harriman lines in Oregon and California, on water-power projects; for past five years consulting engineer, California State Board of Health; member of United States Treasury Department Commission to devise standards of purity for drinking waters served by public carriers engaged in interstate traffic.

Author of numerous engineering reports and technical papers.

Member American Society of Civil Engineers, Pacific Association of Consulting Engineers, American Water Works Association, New England Water Works

Association, American Public Health Association, Bohemian and Commonwealth Clubs (San Francisco), Faculty and City Clubs, Berkeley.

Elisha Lee, '92. Graduate in civil engineering. Assistant general manager, Pennsylvania Railroad. Residence: Philadelphia, Pa.

For three years employed in engineering department of the Pennsylvania Railroad, and successively with same road: Assistant supervisor for two years from 1899; Supervisor for two years; Assistant engineer in the Maintenance of Way Department for four years; Principal assistant engineer of the Philadelphia, Baltimore & Washington Railroad for two years; Superintendent of the New York, Philadelphia & Norfolk Railroad for two years; Assistant to the general manager of the Pennsylvania Railroad for three years; General superintendent of the Philadelphia, Baltimore & Washington Railroad for two years; Assistant general manager of the Pennsylvania Railroad, May 1, 1916, to date; also chairman of the National Conference Committee of the Railways, May 8, 1916, to date.

John Lawrence Mauran, '89. Graduate in architecture. Architect. Residence: St. Louis.

After graduation traveled and studied in Europe, 1890; in office Shepley, Rutan & Coolidge two years, then in their Chicago office, and later represented the firm at St. Louis in 1893, becoming St. Louis partner; member of firm of Mauran, Russell & Garden, 1900; Mauran, Russell & Crowell, 1911. Principal works: St. Louis Union Trust Co., New Bank of Commerce Building, Butler Brothers Buildings (St. Louis and Dallas), Railway Exchange, St. Louis Country Club, Galvez Hotel (Galveston), Rice Hotel (Houston), Skin and Cancer and Children's Hospitals (St. Louis).

Member Public Library Board, 1906-16; Director Mercantile Library, 1901-16 (President, 1908-09); Director Skin and Cancer Hospital, 1909-16; Board of Control, St. Louis Museum of Fine Arts, 1906-10; Advisory Board, Home for Friendless, 1912-16; Presidential elector, 1908; appointed by President Roosevelt member Fine Arts Commission, 1908; appointed chairman Public Buildings Commission, St. Louis, 1904; President St. Louis Grand Opera Company, 1910-12; Chairman "Made in St. Louis" Carnival, 1915; United States delegate to Sixth International Congress of Architects, Madrid, 1904; Fellow A. I. A.; Secretary St. Louis Chapter A. I. A., 1900-02, president, 1902-04; Treasurer A. I. A., 1913-15, president, 1916; President trustees Church of the Messiah (Unitarian), 1900-16; President New England Society, St. Louis, 1913; Member Academy Science, Hospital Saturday and Sunday Association, Missouri Historical Society, American Civic Association, American Forestry Association, etc.; Vice-president American Unitarian Association.

Clubs: Round Table (Chairman Executive Committee, 1906-11, 1916), St. Louis Racquet, University (Secretary, 1896; Vice-president, 1912), Noonday (President, 1904), City, Country (Director, 1908-12), Florissant Valley (President, 1907-09), Architectural, President St. Louis Technology Alumni Association, 1913-16, Commercial (St. Louis), Tavern (Boston), St. Anthony, Technology (New York).

Vice-president of the Alumni Association, 1915, 1916.

Frank H. Page, '85. Student in mechanical engineering for nearly four years. Was obliged to leave on account of defective eyesight.

Went to Minneapolis in 1886; organized and was the first treasurer of the Northwestern Knitting Works; organized the Confectioners' Machinery Company in 1891; business removed to Springfield, Mass., in 1894. This company was purchased by the National Equipment Company, of which he is now president. Treasurer of the Van Norman Machine Tool Company of Springfield, Mass.

Member of Technology Club of New York, Engineers Clubs of New York and Boston, Beverly Yacht Club.

President of the Springfield Board of Trade.

Edward W. Rollins, '71. Graduate in mining engineering. President of E. H. Rollins & Sons, Inc., 200 Devonshire street, Boston, New York, Chicago, Denver, San Francisco. Residence: Dover, N. H.

Five years resident engineer of the Colorado Central Railroad, Colorado, then went into the banking business and formed the firm of Rollins & Young, afterwards Rollins Investment Company and later E. H. Rollins & Sons, with headquarters at Boston; became secretary of the Colorado Electric Company in Denver (now the Denver Gas and Electric Light Company) in 1881, afterwards president, and managed the property for many years, retiring in 1889, at which time came to Boston.

Member of the University Club and Brookline Country Club at Boston and the Technology Club and University Club in New York, Athletic and Country Clubs at Denver, and Midwick County Club at Los Angeles.

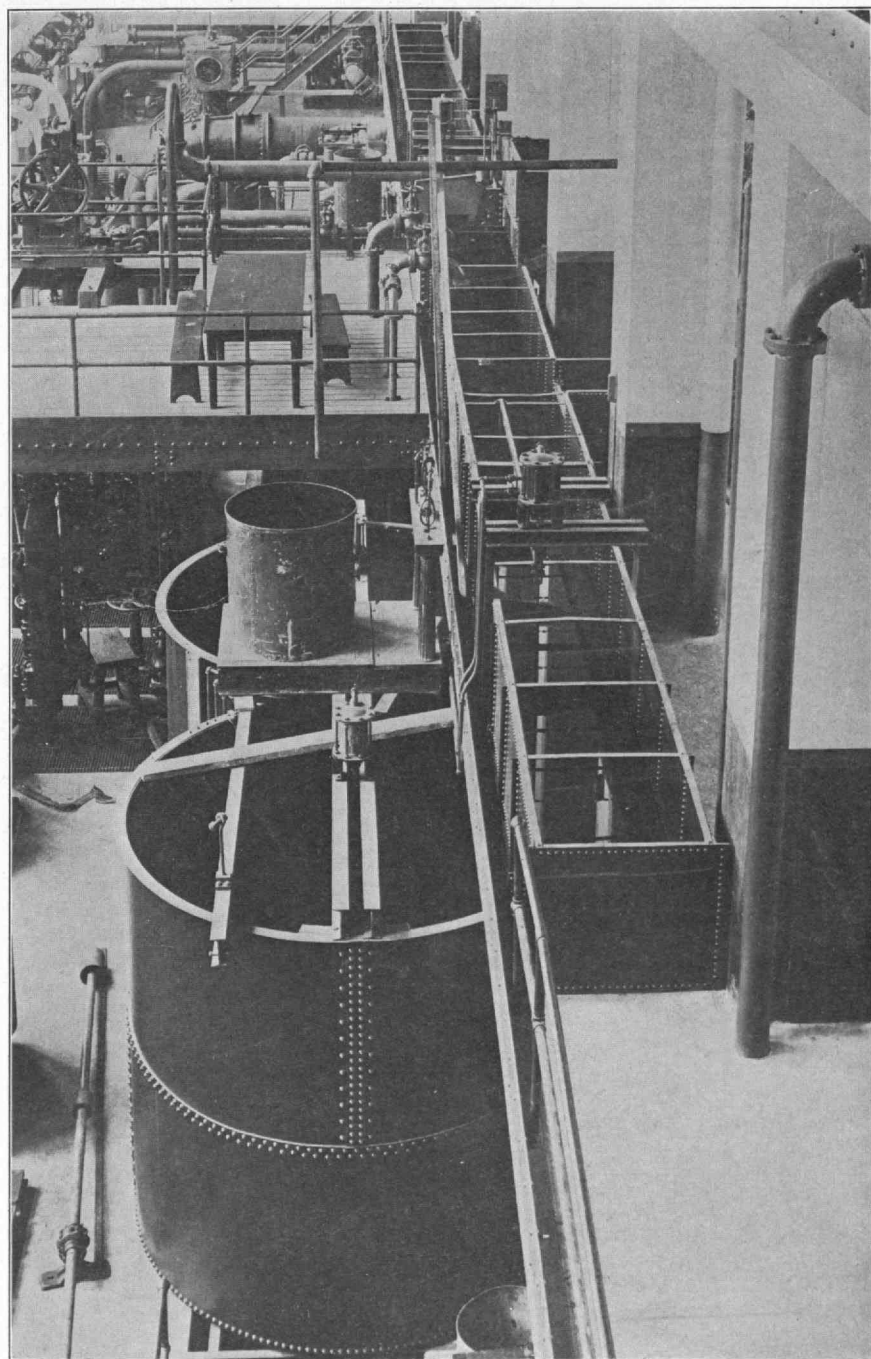
Secretary of the class of '71 and member of the Council of the Alumni Association.

Willis Rodney Whitney, Ph. D., '90. Graduate in chemistry. Director Research Laboratory of General Electric Company. Office: Schenectady, N. Y. Residence: Niskayuna, N. Y.

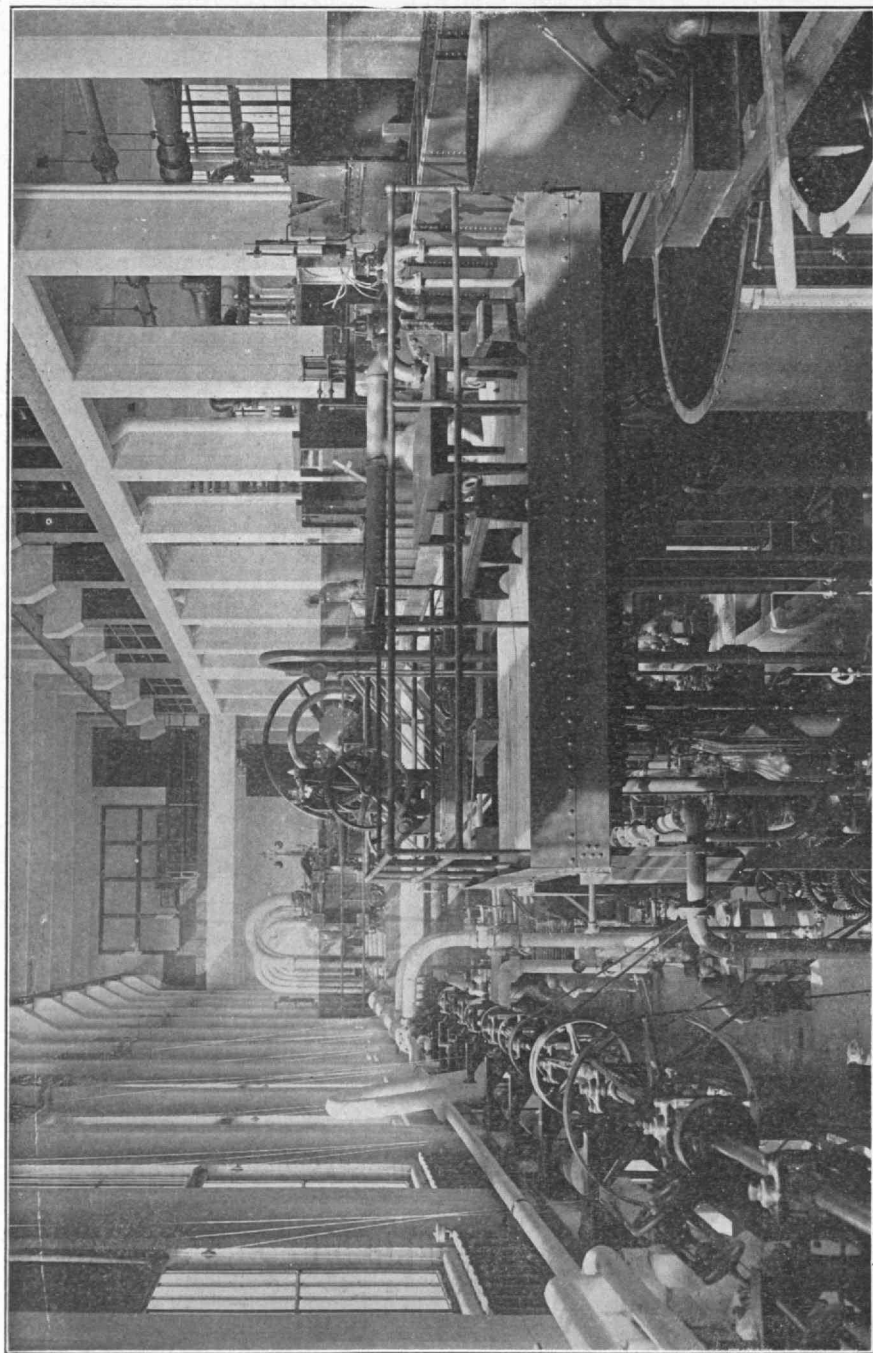
From 1890 to 1904 held the positions of assistant, instructor, assistant professor, and associate professor in theoretical chemistry at the Institute. Student at the University of Leipzig, where degree of Ph. D. was received in 1896. Since leaving the Institute has been with the General Electric Company, and is now director of its research laboratory. Now non-resident professor of chemical research of the Institute.

President American Chemical Society, 1910; American Electrochemical Society, 1911; member American Institute of Mining Engineers; American Institute of Electrical Engineers; A. A. A. S.; American Academy of Arts and Sciences; American Institute of Metals; British Institute of Metals. Now a member of the United States Naval Consulting Board and of the National Research Council.

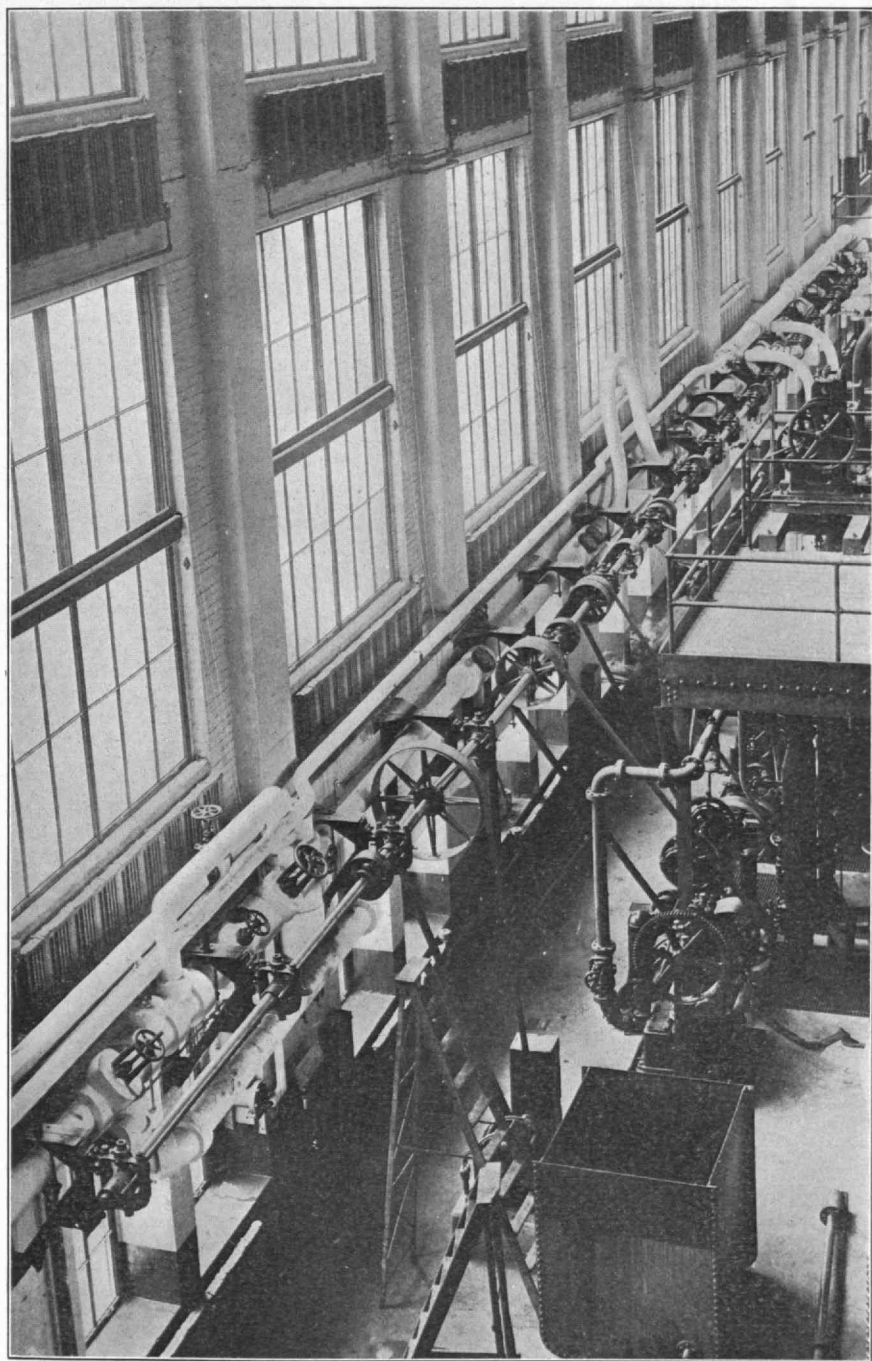
Author of scientific papers.



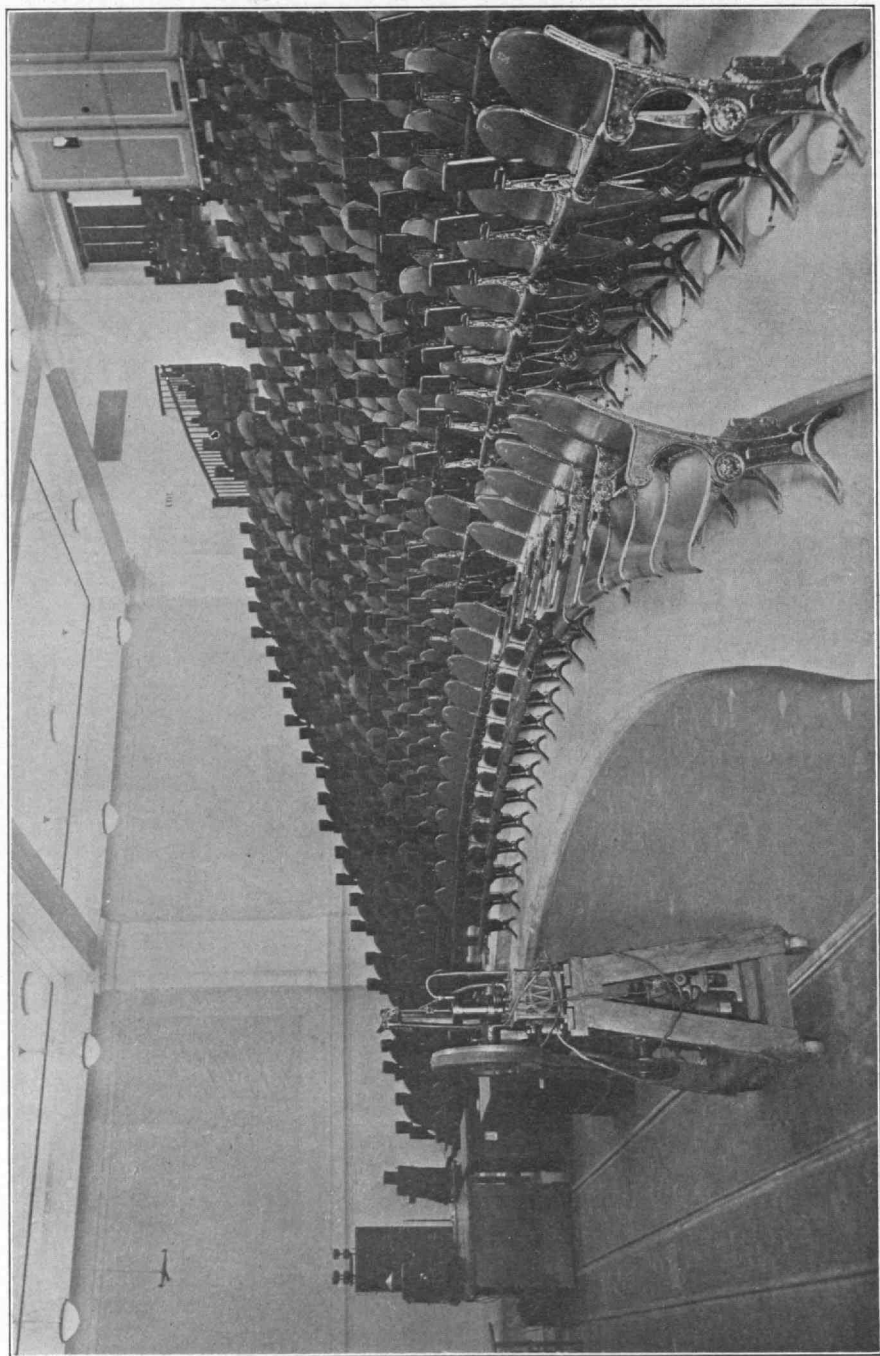
HYDRAULIC LABORATORY WITH TANK AND EXPERIMENT GALLERY



HYDRAULIC LABORATORY—BUILDING NO. 7



SHAFT DRIVE HYDRAULIC LABORATORY



LARGE AUDIENCE ROOM

FACULTY CHANGES AT M. I. T.

Dr. Walker made director of the course in Chemical Engineering Practice—Directors of local stations appointed—Stephen Codman, '92, appointed Associate Professor of Architecture

With the increased demands of the new buildings and the larger number of students, together with the installation of the department of architecture by itself in the Rogers Building and the establishment of five outside stations of Chemical Engineering Practice, the list of changes in the Faculty of the Institute is a long one. Interest is divided between the department of architecture, which is strengthened in its instructing staff and the outside stations in chemical practice in five cities scattered over the eastern country.

In architecture Stephen Codman, business associate of the late Professor Despradelle, has been appointed associate professor; Charles Everett has been advanced to the grade of assistant professor and Edwin C. Holbrook has been appointed instructor in architectural engineering. The appointment of Mr. Codman, long a practicing architect in Boston, is in accordance with the custom of Technology to get for its students men who are in the midst of the business world, for they are practical, and when such a one develops the power of teaching, he has obvious advantages over the purely academic instructor. It was Despradelle who, filled with the fire of his nation, gave inspiration to the recent teachings in architecture at the Institute and kept it in line with the ideals of the Beaux Arts, which it represents more fully than any other school in the country, and Mr. Codman will be relied on to catch up the mantle of his predecessor.

Probably the most important step forward in years for technical education lies in the establishment by the Institute of its stations for chemical engineering practice. These will be for the present five in number, each one an Institute school with its director, assistant or assistants, with lecture rooms, laboratory and library. Students spending a few weeks at each station will become familiarized by actual contact with the important industrial processes of modern times in chemistry, and will return to Boston for a fifth

year at the Institute which, under the circumstances, will be as valuable as two or three would be without the experience.

Prof. W. H. Walker has been made director of the course in chemical engineering practice, and the directors of the stations with the title of assistant professor of chemical engineering are: for the station at Bangor, Hugo H. Hanson, M. I. T.; for Everett, Guy H. Buchanan, Washington and Jefferson and M. I. T.; for Niagara Falls, Dr. Ernest W. Wescott, Harvard and M. I. T.; for Stamford, Leslie T. Sutherland, Cornell, and for Allentown, Pa., Samuel H. Salisbury, Jr., Lehigh. There remain still the assistants to be appointed for these places.

The changes in the other departments of the Institute, including promotions and appointments are—Course I, civil engineering: George L. Hosmer, advanced to associate professor of topographical surveying, and Edward H. Clarkson, Jr., Charles L. Crosier, Chester F. Lewis, William A. Liddell, Charles J. McCarthy, James H. Murdough and Howard L. Foster, appointed assistants. Course II, mechanical engineering: James M. Barker, advanced to assistant professor of structural engineering; Arthur L. Brown, advanced to instructor; Alpheus A. Packard and Stephen R. Bartlett, appointed instructors, and Dean A. Fales, A. S. Morrison, C. A. Coleman and W. J. Barrett, appointed assistants. Course III, mining engineering and metallurgy: Fred C. Langenberg and E. E. Harrington, appointed assistants. Course V, chemistry; X, chemical engineering, and Course XIV, electrochemistry: In the courses of chemistry within the walls of Technology there have been a large number of appointments and changes. General chemistry, James F. Norris, appointed professor; analytical chemistry, Willard R. Crandall and Ralph V. Davies, appointed assistants; and Joseph V. Meigs, assistant in technical analysis; applied chemistry, Robert E. Wilson, research associate; Richardson G. Knowland, Frank Hall and Glover M. Birk, research assistants; electrochemistry, Earl L. Hauman, assistant; chemistry of foods, A. G. Woodman, given title of professor, and John M. Hood, appointed assistant; industrial chemistry, George V. Maverick, assistant; inorganic chemistry, Elwood B. Spear, advanced to associate professor; Ernest W. Wescott, appointed research associate; Duncan Macrae and Clarence K. Reiman, instructors, and Earl P. Stevenson, assistant; organic chemistry, Stephen G. Simpson and Hsien Wu, assistants; physical chemistry, Charles

L. Burdick and Roscoe G. Dickinson, research associates; chemistry of sanitation, Marshall S. Wellington and Helen Vincent, assistants; theoretical chemistry, Earl D. Millard, advanced to assistant professor, and Percival H. P. Gooding, appointed assistant. Course VI, electrical engineering: William E. Wickenden, advanced to associate professor; Ralph G. Hudson and Waldo V. Lyon, advanced to assistant professors; Chester L. Dawes, Verne C. Kennedy and H. B. Richmond, appointed instructors; Frank H. Burkhardt, Harold F. Dodge, W. T. Haines, Walter B. Littlefield and George W. Wyman, appointed assistants; Harrison W. Smith, appointed research associate; Philip L. Alger, Walter E. Wynne, Robert S. Burnup, Russell N. Hunter, J. B. Peterson and C. W. Whitall, appointed research assistants. Course VIII, physics: Daniel F. Comstock, advanced to associate professor of theoretical physics; Donald R. Husted, Frederick P. Upton and Walter J. Wolfe, appointed assistants; William G. Brown and Bailey Townshend, assistants in heat measurements. Course XII, geology: John G. Barry, appointed instructor. Course XIII, naval architecture and marine engineering: Evers Burtner, advanced to instructor in marine engineering; Thomas H. Huff, advanced to instructor in aeronautical engineering; Alexander Klemin appointed instructor in the latter and Harold Larner, assistant in the former. Course XV, engineering administration: Lincoln F. Schaub, appointed lecturer in business law; Edward L. Walker, in valuation of public service and other corporations, and Caleb M. Saville, in specifications and contracts; Martin J. Shugrue is advanced to assistant professor of economics; Floyd E. Armstrong, appointed assistant professor; E. O. Christiansen, instructor in business management, and C. H. Sutherland, instructor in report writing.

In the general fundamental studies there have been fewer changes, one of which, however, being the addition of an instructor in Spanish, is suggestive of preparedness at Tech.

In drawing and descriptive geometry, C. L. E. Moore has been advanced to associate professor of mathematics and Walter J. Hauser to instructor in drawing and geometry; George R. Stevens has been appointed assistant in free hand drawing and Charles M. Wareham, assistant in drawing and geometry. In the department of English, Henry L. Seaver has been advanced to associate professor, and William A. Crosby, Winward Prescott, William B. Pressy and John K. Torbert, appointed instructors. In the depart-

ment of modern languages F. W. C. Lieder and F. S. Cawley have been appointed instructors in German, and Guillermo Rivera, instructor in Spanish. In military science Capt. Frederick B. Downing has been detailed to Tech by the Government and is termed assistant professor, and Leicester F. Hamilton has been appointed assistant. In physical training, which counts at Tech as a necessary study and must be followed regularly and in prescribed fashion, John W. Kilduff has been appointed assistant.

There are in addition some seventy-five reappointments.

Gen. Charles J. Paine Dead

General Charles J. Paine, owner of the cup-defenders *Volunteer*, *Mayflower*, and *Puritan*, and for many years perhaps the best known yachtsman in this country, died August 12, in his eighty-fourth year. He was a veteran of the Civil War, and received the brevet of major-general for "meritorious and valuable services" at the capture of Fort Fisher.

General Paine was for many years a director of the Chicago, Burlington & Quincy Railroad, the Atchison, Topeka & Santa Fe Railroad and the Mexican Central Railroad. He was one of the three special envoys accredited to the Governments of France, Great Britain and Germany in the interests of international bimetallism during 1897. General Paine was also a member of the Corporation of the Massachusetts Institute of Technology.

Copies of "The Tech" Wanted

The Alumni Office is trying to collect a complete set of the publications of the undergraduates and also of the alumni. We have no copy of the *Spectrum* which was published during the late seventies, neither have we the following volumes of the *Tech*: 1884-85, Volume IV; 1885-86, Volume V; 1886-87, Volume VI; 1888-89, Volume VIII; 1889-90, Volume IX; 1890-91, Volume X; 1891-92, Volume XI. If any of our readers have any of these missing volumes they will be welcome for the library in the Alumni Office.

ENGINEERING ADMINISTRATION

First class in this course will be graduated in 1917—Announcement of a number of new appointments on the teaching staff

The new school year at the Massachusetts Institute of Technology marks the beginning of the full development of the courses in engineering administration. The original work, as presented by Dr. Davis R. Dewey, under whose care the course is given, began with the current sophomores of two years ago. When these became juniors the special features of the course were emphasized and additions made to the instructing staff and this year the original young men in the course are seniors and the scope of the special work widens so that business law, cost accounting, business management, taxation, etc., are added to the engineering studies. The fourth year's studies are specialized for different branches of engineering work, so that there are in reality three administration options which are dominated in their arrangement by the choice of the student, who may relate the business courses to civil engineering, mechanical and electrical engineering, according to his desires.

To provide for the instruction of the young men, who now number about one hundred and fifty in the three years, additions have been made to the instructing force, namely Floyd E. Armstrong, to be assistant professor of economics, E. O. Christiansen, to be instructor in business management and Prof. Lincoln F. Schaub, A. M., LL. B., to be lecturer in business law.

Prof. Lincoln F. Schaub, A. M., LL. B., of Harvard University has been appointed special lecturer in the courses on engineering administration at the Massachusetts Institute of Technology. His work at the Institute will be in the instruction in business law of the fourth year students.

Floyd E. Armstrong, who has been appointed assistant professor at the Massachusetts Institute of Technology in the courses in engineering administration, is a native of Marlette, Mich.

He is a graduate of Mount Pleasant State Normal School in Michigan, and for a number of years was engaged in executive work connected with education. He was superintendent of schools

in Gladwin County and for a portion of the time acted in the same capacity also for the city of Gladwin, the county seat. Next Mr. Armstrong took up business in a local bank for three years, but the call for teaching was so strong that he undertook to fit himself better and entered the University of Michigan in 1912 as an upper class man, graduating with the degree A. B. Since that time he has been engaged in the department of political economy in this university in general economics having charge the past two years of the courses in this study for engineers. He was also instructor in the courses on corporation finance and railway problems, and was to have had charge the coming year of the courses in business law.

Since receiving his B. A., Mr. Armstrong has undertaken post-graduate work at the U. of M., and has now the degree, M. A.

Aside from regular academic duties Mr. Armstrong has undertaken work, first with David Friday, head of the department of economics at Michigan in the valuing of public utilities and again in the appraisal of the lands of the Pere Marquette Railroad Co. and the Detroit United Railway. His special subjects at Tech will be political economy, industrial organization and taxation.

"Technology Women"

A book recently issued, entitled "Technology Women," is of interest to suffragists who are constantly confronted with the objection that women have no business except at the sewing machine and cook stove. Women have very definite business in the science laboratory, it seems, since the women graduates of Massachusetts Institute of Technology are filling important posts in many fields of science—dietetics, sanitary science, bacteriology, chemistry, obstetrics, architecture, museum work.

"Many of them are married," says a comment in the *New York Evening Post*, "and unquestionably finding their knowledge of science invaluable in the home. For instance, who knows the meaning of the words 'absolutely clean' as well as a chemist?"

TECH'S ENGINEER CORPS

Will be reorganized and be more directly under supervision
of War Department

The Engineer Corps at Technology will be reorganized this year and will be more directly under the supervision of the War Department. Major Cole, who has been in charge of military affairs at the Institute for the past few years, and who first organized the corps at the Institute, will be the acting head of the corps. At the meeting held to discuss the reorganization, Capt. F. B. Downing, U. S. A., who has been detailed at the Institute to take charge of the work with Major Cole, explained the system to be followed this year. All the units of such a corps existing in the regular army, including hospital and ambulance corps, will be duplicated at the Institute. The Government will furnish the necessary equipment as far as appropriations will allow, and the work will be directed by an army officer, assisted by as many men from the enlisted army as are found necessary. Membership in an organization of this kind is open to anyone at the Institute who is over fourteen years of age, and whose bodily condition is such that he is judged fit to perform military duties. The training will consist of a course of three hours a week for two years, after graduation from which the candidate will, if possible, take another two-year course of five hours a week. The time spent in these courses will be divided between drill in military tactics and practical army engineering work. The Government has already promised two tool wagons to aid in the work and also two pontoon boats as an aid to the construction of small bridges. Lectures similar to those given last year on such subjects as "Construction of Temporary Military Roads," and "Permanent Land and Sea Fortifications," will be also included in the course. Captain Downing was very enthusiastic over the opportunity for men at the Institute to start immediately upon a successful military career. An act recently passed by the Government makes it possible for a graduate of a technical school by examination to receive a commission as second lieutenant in the regular army without the former requirement of eighteen months' experience.

WHEN WE WERE FRESHMEN

Reminiscences of serious or humorous experiences of Alumni during their student days at the Institute

I was a farmer's boy. I had gone to the district school in the winters and worked on the farm in the summers. Occasionally I was given a term in some other school as in the academy at Chester, Vermont, and finally in a school at Maynard, Mass. This last was supposed to be a high school but it had no definite course of study. In order to supplement my studies in school I kept my books on my wagon seat when driving the market wagon to Boston or when using it around the farm and in this way getting a chance to study whenever the horse did not require my undivided attention. I also kept my books on the window-sill back of my seat at table and hurrying across the farm when we were called to meals I often had ten to fifteen minutes to study before the others were ready to sit down.

Finally, as I saw no chance to get the education I wished, I left the farm and, one April morning, went to Worcester, Mass., and worked at carpentering and painting during the summer. In October I left Worcester and went to an uncle in Eau Claire, Wis., where I worked with him in building a large sawmill. This work giving out, I worked in a blacksmith shop for some weeks. Then I went with my uncle into the back country and helped him build the first frame house in the present town of Tiffany, Dunn County, Wis. While building this house we slept in a German's log-cabin whose dimensions were twelve feet wide and sixteen feet long. The German's family consisted of himself, wife, three children, wife's sister, and a girl. This made nine occupants of the small log-cabin. The thermometer constantly registered something below zero and often as much as -40° . At the gable ends of the cabin there were cracks two inches wide between the boards so that we were practically always covered with drifting snow while we slept and this we had to brush from our clothing before dressing each morning. During this experience I did a great deal of thinking about my future and decided that in some way I must get the education I desired.

I came back to my father's farm in Sudbury, Mass., in April and worked through the summer, meanwhile corresponding with the secretary of Harvard University as to what were the possibilities of entering that Institution. As I had had no Greek and but little Latin I found that it would take longer to prepare for Harvard than I could spare the time. Just as I was in despair I was told by our clergyman, the Rev. W. A. P. Willard, of a new school that he thought would suit my tastes even better than a college. This was the Massachusetts Institute of Technology. I visited an aunt in Arlington and there learned of one of her neighbor's sons, Newton Frost, who was at that time a freshman at the Institute. I at once called upon him and was told that I did not want to go to the Institute unless I was willing to work like the ———. Learning from him how to find the Institute, I called there the next forenoon. It required all the courage that I could muster to walk up the steps and enter the imposing doorway. In the secretary's office I found a tall, thin, elderly gentleman, whom later I came to know as "Sammy," who asked me what he could do for me. I was so overawed and frightened that I could really say nothing and, seeing the extreme embarrassment of the green country boy, the gentleman handed me a catalogue of the school and I came away feeling much as one who had bearded a lion in his den and got safely away.

I read over the requirements for entrance when at home and judged that if I could find the right kind of a fitting school I could prepare in one year. I wrote to the secretary for advice and was told of the Warren Scientific Academy at Woburn. Thither I went and interviewed Professor L. S. Burbank, the principal. After a short talk he asked me to try the examination for entrance at once. This I did though I had not been at school for nearly two years. It so happened that in passing away the day before which was rainy I had spent some time in drawing a map of Africa and in the examination in geography one of the questions was to draw such a map putting in the principal points. I drew the map with considerable detail so that whatever Professor Burbank thought of the remainder on my paper I concluded that he would judge that I was first class in geography. I passed the requirements and entered the academy the next Monday which was just after Thanksgiving.

The academy year had begun in September and consequently

I was about three months behind the work in the classes. To make up this deficiency all the instructors kindly gave me extra time for separate recitations. For three months I worked very steadily taking no time for recreation or rest, even on Sundays. I rose at 5 a. m. and retired at 9 p. m. On the first of March I joined the classes in their regular work. I had done six months' work in three but I had severely injured my health which cost me a serious loss at a later date.

At the academy were students from various parts of the United States and from abroad. Among these I formed many friendships that have lasted through life. Mitzuoka and Takuma Dan, two Japanese students, especially attracted my attention. The former cared more for a good time than for his studies but the latter took high rank and at the end of the year entered the Institute in advanced standing as a sophomore in the class of '78. He has since become one of the leading men of Japan but is still the same simple, cordial fellow who visited me at my home while a student. Harry Reed of Lowell also entered the class of '78, but later gave up scientific work and has devoted his life to theatricals.

In June, twenty-one of the students took the examinations at the Institute. Ten passed without conditions, ten passed with conditions, and one had his papers refused without examination as Professor Nichols, who was in charge of the examinations, saw him communicating with some of his neighbors. I was among the first ten, a fact of which I was at the time very proud. The first day of the examinations I was so frightened by the imposing grandeur of Rogers Building and the dread of the coming ordeal that I could not at first force myself up the steps and I walked back as far as the Public Garden and then retracing my steps rapidly I ran up the steps before taking time to think. As we were writing, various students came to glance at the coming "Freshies" and seemed to gloat over us. How I then envied them. Newton Frost was one of these spectators of our misery and I have a distinct memory of his smiling countenance and of the armless sleeve at his side as he glanced in upon us. Little we thought then of his soon-coming death in the waters of Florida.

On the second morning of the examinations I had gained courage enough to look around a little and speculate upon the new faces, those with which I was to become well acquainted in the coming years. However, I now have only a very indistinct recollection

of bowed forms and wrinkled brows. Standing upon the steps of Rogers I saw a horse and buggy approach and heard one of the '78 men say "There is Charley Baker," this being my first glimpse of a future friend.

Of the eighteen from Warren Academy who took the examinations to enter with the class of '79, only twelve did so, the other six dropping out for various reasons. Of the twelve who did enter, only two, Stearns and the writer, graduated. This great decrease in numbers was caused by various means. In the department of chemistry we encountered Professor William Ripley Nichols, a brilliant student, an exceedingly hard worker, and an absolutely honest man. He had little patience with those who were either slow in their work or who tended to slight it in the least and he often goaded the students with very sarcastic remarks. For this reason several became "specials" simply to get out of his classes by dropping chemistry. This was unfortunate for, when we had once become accustomed to Professor Nichols, we found that the really earnest student had no better friend than he, no matter how dull he might be.

Others were offered places before graduation which seemed too attractive to refuse and so left school to accept them. Of these men, Mitzuoka died soon after his return to Japan, and Waite died a few years ago after a long connection with the Boston *Herald*. Blake is at Worcester, so much a semi-invalid that he is seldom seen. Curtis is at St. Paul, Minn., whence he occasionally writes me a letter full of his characteristic fun. Fullerton is a prominent official of the Long Island Railroad Company, Long Island, N. Y. McQuesten is a retired capitalist here in Boston and so changed that I mistook him for some bishop at our last dinner and had to ask who he was. Sonrel, "Filleuil D'Agassiz, le grand maitre," as he wrote in my autograph album, I have not seen or heard from for many years. Spicer, who was one of the first to greet me at Woburn, the favorite of all, has an important position at Montreal, where I hope to see him this summer. Stearns is in Ohio. I have neither seen nor heard from him since our student days. Of Stephenson I know nothing. Young, who was the most impressive looking member of our class, has long been a dentist and though he is located on Boylston street, Boston, I have not seen him for many years.

In the summer following our freshman year we went to the

Centennial Exposition at Philadelphia making a small portion of an Institute party that numbered 415 in all. We camped on the grounds of the University of Pennsylvania and observed military law during our stay. Jesse Shepard, who had prepared at Woburn and had passed the Institute examinations with me, shared Tent 12, Section F with me. During some of the days the heat was so intense that the candle in our tent melted. As this was just preceding the Republican Convention for the nominating of a candidate, there were exciting discussions concerning the outcome but the general favorite was Brewster. The tents of Julian Kebbler and Bill Adams of '78 were favorite lounging places for many of us when in camp and many were the discussions carried on in them. As I look back to the Exposition, my remembrances of that are much less vivid than are those of the camp life and of affairs outside. The most vivid remembrance of an occurrence inside the Fair is that where a countryman and his wife mistook a live soldier for one of the lay figures that were used to represent the people and dress of different nations. The woman went up to the soldier and was examining his uniform when he suddenly walked away and the expression of astonishment that spread over the woman's face at this act convulsed the onlookers.

After our return to school in the autumn a large body of the Institute students took part in the Hayes and Wheeler torchlight parade. We were all dressed in full white and, being placed in advance of the butchers, who were also dressed in full white, we incurred their enmity. At Franklin square they attempted to rush by us and precede us in the line, but by a vigorous use of our torchlights as weapons we prevented this and held our own. Today it is difficult to realize that several who took part in that lively little scrimmage are no longer living as is the case with Alden, Allen, Fifield, Mitsuoka, Owen, Pope, Waite, and others, or that Campbell, the manliest of us all at that time, is ill beyond recovery. One day we were taken down the harbor by our military instructor to inspect the forts and on the way back sang *Das Grab ist tief und stille* a poem which we were then translating under Professor Otis, and from that time *Das Grab* has been the class song of '79 and is sung at all our class dinners.

Finally came a fit of sickness which caused me to lose one term's work and much to my sorrow I had to fall back into the class of '80 with which I graduated in due time. '80 was a small class from

the beginning and it gradually decreased in size till only eight of us graduated, Brown, Chase, Clark, Hamilton, Millen, Miller, Small, and myself. Of these 50 per cent. are dead, Brown, Clark, Millen, and Small. Of those living, 50 per cent. were present at the Great Reunion just past, Miller and myself. Hamilton is in Boston but did not attend, and Chase in Denver, Col., could not leave his business at this time. Chase writes as follows:

I begin to think my big stick did a heap of good for it stirred you up to writing that interesting article in the last REVIEW. It was fine and I hope you will repeat it along some other line in the future. We are all interested in knowing what our fellow man is doing, when he belongs to such select company as composed the class of '80 and sorry enough was I to learn through the same issue of the death of my old friend and chum, Fred Clark.

Four gone out of eight makes the survivors feel they are fortunate to be still living. Am sorry I cannot get on to the Reunion. Too much business right now owing to the high metal prices and the excitement over rare metals. Now get after Hamilton and Miller and tell them an article is coming from them on penalty of excommunication. We have got to show the other classes we can make as much noise in the world as they can. Gideon's band, if I remember rightly, was cut down to about the size of '80 before Jehovah allowed them to go to battle.

GEORGE HUNT BARTON, '80,
Director, Teachers' School of Science,
Boston Society of Natural History, Boston.

Long an Instructor at Tech

David A. Gregg, who died September 16 at his home at 15 Green street, Somerville, taught a portion of each week for twenty-six years at the Institute, on "Architectural Illustration." He was born at Morristown, Vt., on April 23, 1847, a son of Rev. Oren Gregg, a Methodist minister. He studied architecture in New York and took a two years' course at the Royal Academy, London, from which institution he held a medal. He became connected in 1880 with the *American Architecture*, a journal devoted to the interest of architects. Mr. Gregg had lived in Somerville since 1891. He was married in 1882 to Miss Jennie Corliss of St. Albans, Vt., who died some time ago. Mr. Gregg is survived by a daughter, Mrs. John Jennings, Jr., of Somerville.

ALUMNI NOTES

Organizations never before as strong nor as active as now—
Winter program to be a lively one—Real preparedness
to be the theme

NEW HAVEN, CONN.—Tech men with the Winchester Repeating Arms of New Haven, Conn., enjoyed a very successful “get-together” on Wednesday evening, October 18, 1916. An informal dinner was held at the Graduates’ Club, followed by bowling.

The plans for making the men better acquainted with each other and for organizing a strong unit of M. I. T. men were very successfully carried out by the committee: E. Pugsley, ’11; H. M. Wilcox, ’05; E. W. Taft, ’13; and R. L. Parsell, ’14.

Plans are to be made shortly for a definite organization of all Tech men in New Haven and vicinity.

Other Tech men present were: J. Lawrence Gilson, ’03, J. B. Welch, ’13, J. S. Gravely, ’11, A. W. Hitchcock, ’98, Loren N. Downs, Jr., ’10, J. D. Robertson, ’16, S. S. Raymond, ’16, George B. Malone, ’06, Chas. W. Brown, ’13, Edward N. Taylor, ’13, C. Theo. Dunn, ’15, C. W. Olesen, ’15, John E. Woods, ’16, Ping Yok Loo, ’16, Nelson MacRae, ’16, Edw. E. Freeman, ’17, Raymond C. Foster, ’13, Thurston C. Merriman, ’05.

THE TECHNOLOGY CLUB OF ROCHESTER.—The season for the Rochester Club begins at its annual meeting, October 30. The club will then vote in its new members and make its plans for the following year.

The summer of 1916 meant, for the Rochester Club, two big events. First the grand Reunion at Boston, and second the telephone dinner at Rochester. Rochester’s part in both have been described in the July number of the REVIEW.

In July 1916, the All College Men’s Club held their annual picnic at the lake. Any college man can go, and all are seated at the dinner by colleges. Technology was very well represented by numbers and its presence very much in evidence by its cheering; Cornell had the largest number of graduates, the University of Rochester next while Technology was third.—*W. G. Bent, ’05, Secretary, Kodak Park Works, Rochester, N. Y.*

The seventh annual meeting of the Technology Club of Rochester was held at the Powers Hotel, October 23, 1916. B. C. Hopeman, '00, presided and the following men were present: S. C. Allen, J. F. Ancona, M. B. Black, I. E. Adams, J. P. Barnes, W. G. Bent, W. P. Cross, A. S. Crocker, J. C. Dryer, O. K. Foote, Geo. Fuller, J. H. Haste, B. C. Hopeman, V. E. Lacey, A. Lomb, F. W. Lovejoy, W. S. Lucey, W. Wm. Stephenson, F. B. Saegmuller, H. O. Stewart, A. F. Sulzer, H. O. Sommers, H. H. Tozier, W. G. Wilder, W. McMenimen, A. A. McMenimen, and R. Richmond.

After the reading of the minutes of the last meeting, the following applications for membership were presented: Matthew Black, I, '11; Irving E. Adams, XII, '04; Joseph N. Paul, VI, '13; Henry O. Sommers, VI, '16; B. S. Fenner, IV, '11; R. A. McMenimen, X, '14; W. Wm. Stephenson, IV, '15.

These men were unanimously elected.

The chairman appointed J. H. Haste, '96, A. F. Sulzer, '01, and W. G. Wilder, '01, as a nominating committee to prepare a slate of officers of the club for the following year. While the committee was in session, the club took a straw vote to find out the sentiment for the coming Presidential election. Out of a possible twenty-eight votes, eighteen were for Hughes and eight for Wilson, two not voting.

After a discussion of the efforts that have been made to add the other Technology alumni of the city who are not members of the club to our list, it was moved that a floral wreath be sent to each and that a memorandum of their deaths be spread upon the records of the club. This motion was not seconded.

The nominating committee brought back the following slate and the candidates were elected: President, A. Lomb, '92; first vice-president, J. C. Dryer, '99; second vice-president, J. P. Barnes, '05; secretary-treasurer, W. S. Lucey, '07; member of Executive Committee for three years, E. M. Hawkins, '97.

Mr. Lovejoy and Mr. Hopeman spoke very touchingly in tribute to our late president, William E. Hoyt, '68.

Correspondence was then read by the secretary from the Musical Clubs in Boston who wish to give a concert in Rochester during the mid-year vacation in 1917. Several of the men spoke on the subject of the advisability of having the clubs come to Rochester. It was then moved that the club investigate and the Executive Committee should decide whether or not to have the clubs come

here. The meeting was generally favorable to having them come and all seemed willing to do a lot of work. The final decision of whether a favorable date could be arranged and the settlement of the matter with the manager of the clubs was left to the Executive Committee.

For the benefit of the men who were in Boston and those who could not attend, H. H. Tozier, '96, was requested to give a description of the telephone dinner which was held in Rochester during the dedication of the new Technology buildings. He described in detail the tuning up of the instruments and the work that was done by the telephone company's representatives previous to the night that the speeches were given in Symphony Hall. Many interesting points came up among the workmen, some of which Mr. Tozier related. The dinner proved to be a very fine success and the guests all seemed very grateful that they were allowed to attend. It was voted that Mr. O'Hea of the Bell Telephone Company should receive the thanks of the club for making the affair such a success.

Shortly after, the meeting was adjourned.—*W. S. Lucey, '07, Secretary-Treasurer, Kodak Park Works, Rochester, N. Y.*

TECHNOLOGY CLUB OF MILWAUKEE.—We are still having our Thursday noon luncheons at the University Club which are followed by a game of "Kelly Pool." We want all traveling Tech men to note this and join in the fun. Mitchell Mackie, who used to collect the money after the game, has taken a position as sales manager with the Waukesha Motor Company, and we are now paying our coin to Henry Norris.

Charlie McIntosh has not been to luncheon since the middle of June. It usually takes a year after their wedding day before they return. "Smithy" was away for two years!—*J. F. Blackie, '04, Secretary, care of The Milwaukee Coke & Gas Co., Milwaukee, Wis.*

TECHNOLOGY CLUB OF NEW HAMPSHIRE.—The Tech Club of New Hampshire held its sixth summer outing Sunday, July 2, 1916, as the guest of its president, E. W. Rollins, '71, at his summer estate, Three Rivers Farm, Dover, N. H.

New Hampshire Tech men as a rule are a modest bunch, but we sure do swell up with pride when visiting delegates from neighboring clubs make a repeat trip to our party. We don't advertise, but when asked about our outing we just naturally open our cut-



Guests of President E. W. Rollins at Three Rivers Farm, Dover, N. H.

TECH CLUB OF NEW HAMPSHIRE

out, move in the line of least resistance, and tell our audience that you just naturally can't tell about the good-will, cheer and enthusiasm of our times, or of the "eats." It's a thing that has to be experienced in person; you just eternally bloom, blossom, and exhale good-fellowship after one trial. We were, therefore, some gratified to greet Bob Lord, '05, from Gorham, Me., on his second appearance, and to have him bring with him the three other charter members of the Maine Club.

The feat that attracted the attention and gratified the bunch was the appearance of Hugh K. Moore, '97, and Tommy Estabrook, '05, who broke camp in Berlin, N. H., at 7 a. m., and were on deck with the bunch at Three Rivers Farm at 11 o'clock. This is the first time we have had any of the north country crowd with us, and we had a regular "Old Home Week" time of it.

Peace! So say we all of us. Well, believe me it was some peaceful at the old farm until the boys began to arrive around 11.30 and were welcomed by an introduction to Tom and Jerry, who are now life members of the club. The usual ball game between the married and unmarried men was played soon after our arrival. Then followed chapel services at which Bill Bryan presided, aided by an elaborate array of the national beverages. The club members, preceded by the lady guests, then formed in file by twos and marched to the dinner tables spread in a spacious pine grove near the mansion. The tables were effectively arranged in the form of the letter "T" and, when seated, it was found that our host had provided bibs for us on which the letter "T" was designed in red causing considerable pleasant surprise and admiration among the men. Then came a good old-fashioned lobster bake such as can be had nowhere else, together with many delicacies making in all a very appetizing, satisfying repast, which was interrupted by intermittent Tech yells and songs.

After the dinner our host made a short, cordial address of welcome and then turned the conduct of the postprandial exercises over to one of our most ardent members, J. W. Rollins, '78.

Previous to calling upon the speakers of the occasion, the secretary was requested to read the resolutions adopted by the club in March on the death of our beloved friend, Frank West Rollins, '87, who was also brother of our host. A silent toast was then proposed by the toastmaster, and we drank in memory of our departed fellow alumnus.

Our good friend and foster-father, Ike Litchfield, was then asked to start the "oratorial caloric." I think it can be safely stated that we yaps up here depend upon him on these occasions to say the pleasing, balmy, proper things to our host which we yearn to say ourselves, and lacking the power of correct expression are only too pleased to leave to one whose efficiency in that line of gab is unquestioned. The fact that he is worthy of our confidence is indicated in the following original poem with which he wound up his remarks:

TO OUR HOST

Here's our anniversary greeting
To our dear and valued friend!
He's a mighty good investment
For he pays a dividend;
Every blessed time I meet him
My interest in him grows,
And I thank my stars and garters
I'm a feller that he knows.

Seventy-one he says his class is,
Though I question hard the date,
For he sometimes "acts like sixty,"
And I often think he's eight;
Anyhow, here's health and comfort
In a glass of—what you like,
Pros't, *gesundheit*, and God bless you,
Edward! Yours sincerely, Ike.

Our own local orator, George B. Lauder, '89, in whom we have an inordinate amount of pride, was next called upon, and he sure made a "knockout" speech. Let me start at the beginning with him. He told how the beaver had been chosen as the mascot of Tech on account of its engineering skill, and how our vice-president, Norwin S. Bean, '94, had after diligent search found, purchased and presented one to the Tech Club of New Hampshire in March. This same beaver was taken to Nantasket on June 13, assigned first place in the mascot parade, and the club was led in march by its president, E. W. Rollins, '71, followed by Vice-President N. S. Bean, '94, with the beaver borne by club members. He said it was the feeling of the club that, after its extensive travels, the beaver ought to have a home in its natural habitat, that the surroundings at Three Rivers Farm were considered ideal, and that it was hoped President Rollins would accept the custodianship of our "mascot."

Mr. E. W. Rollins then made a short speech of acceptance, and at this time announced that he wished us to set aside some Sunday in June, 1917, for our outing at Three Rivers Farm. This announcement brought down the house, and he was assured that we would all be on hand.

The outing of the Tech Club of New Hampshire is the creation of our good Prexy, E. W. Rollins, '71, whose enthusiasm, hope, good cheer, animation, initiative and generosity inspires our pride, puts us *en rapport* with our better selves and makes the occasion one that is often recalled. As the good old song goes, "We hope he lives to be a hundred and then one hundred more."

After speeches made by Mr. George D. Barrett, mayor of Dover, N. H., R. H. W. Lord, '05, of Gorham, Me., R. A. Hale, '77, of Lawrence, Mass., Montgomery Rollins, '89, of Dover, N. H., John Ritchie, Jr., publicity manager of M. I. T., Prof. F. W. Taylor of New Hampshire State College, and Mr. Ashton Rollins, the gathering broke up and the men returned to their respective homes to await the call for the next outing.

Those present were as follows: Concord—Omar S. Swenson, '04; Guy A. Swenson, '13; George B. Lauder, '89; C. A. Hall, '08; L. S. Hall, '14. Manchester—W. D. Davol, '06; S. L. Flanders, '74; W. M. Africa, '15; M. H. Towle, '06. Berlin—Mr. J. W. Estabrook; Hugh K. Moore, '97. Nashua—Arthur J. Connor, '88. Merrimack—P. L. Caldwell, '11; H. S. Clough, '09. Wilton—W. G. Abbott, '06. Dover—Mayor George D. Barrett; Dr. George R. Smith; Mr. George J. Foster; Mr. Fred Foster; Mr. William A. Goss; Mr. E. A. Shorey; Montgomery Rollins, '89; Dwight Hall, and the host, E. W. Rollins, '71. Durham—Mr. F. W. Taylor; Mr. B. E. Curry; Mr. J. C. Kendall. From Maine: Portland—K. E. Terry, '06; E. Sutermeister, '99. Gorham—R. H. W. Lord, '05; Joseph A. Warren, '91. From Massachusetts—I. W. Litchfield, '85; C. H. Johnson, '05; F. W. Goldthwait, '05; C. H. Bartlett, '85; George W. Treat, '98; Mr. Charles E. Carleton; J. W. Rollins, '78; William E. Spaulding, '94; Andrew Fisher, Jr., '05; Mr. Wingate Rollins and Mr. John Ritchie, Jr.—*Walter D. Davol, '06, Secretary, Amoskeag Bank Bldg., Manchester, N. H.*

THE CINCINNATI M. I. T. CLUB.—The following is a list of Tech men in Cincinnati, who went on to Boston for the great celebration: W. P. Anderson, Stuart Miller, Charles Merrell, J. C. Hobart,

C. R. Bragdon, Frank Perin, Harry C. Pugh, Raynor Allen, H. D. Loring, H. D. Morse, Morse Rew, Gus Drach.

The annual outing of the club was held at Woodland Park, and there were the usual sports—baseball, tennis, swimming, rowing, dancing, concert, and a big dinner. Tech and other songs made the trip home more interesting.

Howard F. Morse, '03, who is one of the local club's directors, and one of our most enthusiastic members, has gone to Detroit in order to organize a Bureau of Municipal Research in that city. Mr. Morse has been a strong influence in the affairs of the local government as well as in the Cincinnati Tech Club.—*Edward E. Kruckemeyer, '11, Secretary, 111 East Fourth Avenue, Cincinnati, Ohio.*

TECHNOLOGY CLUB OF NEW BEDFORD.—The annual clambake of the Technology Club of New Bedford was held as usual at George Nye's bungalow, at Allen's Pond, on Saturday, the 23d of September, twenty-two men braving the rain storm to see the sky clear, and enjoy an excellent bake and the after fun. Carrying out the idea of last year, when all sorts of preparedness stunts were pulled off, the chief features of this year's affair were various kinds of gun practice. Every one entered for the pistol practice, five shots to each man. No bull's eyes were made, but as the pistols shot round discs at a hole in the target, six feet off, this must not be wondered at. There was also regular target practice with rifles, between George Faunce's team, and George Nye's team, a toy gun duel between E. H. Wing and Phil Young, and trap shooting which consisted of shooting at clay pigeons suspended from the trees in the woods, 100 yards off. There was also a boxing match between George Nye and David Beaman, one round, and George Nye made the box first. There was also an antedeluvian potato race between Ned Wing and Tom Williams, the potatoes being 30 to 40 pound stones; Tom Williams won.—*Charles F. Wing, Jr., '98, Secretary pro tem., New Bedford, Mass.*

DETROIT TECHNOLOGY ASSOCIATION.—No definite plans have been made for the coming winter, with this exception, six clubs, namely: Cornell, Harvard, Illinois, Wisconsin, Ohio State, and Technology have formed an Intercollegiate Bowling Association, which meets every Tuesday evening at the Pallister alleys, where six alleys have been preserved for the season. This association

has, so far, had two meetings, both being very successful. At the end of the season, it is proposed to have a big banquet for all concerned, at which time prizes will be distributed to the winners.

Unfortunately, largely due to tremendous business pressure here, the summer outing which was so enjoyed by all last year was not repeated this summer, but some sort of "get together" stunt will be observed in the near future, possibly with the ladies present.

I wonder sometimes if you people in the East are working under the same pressure that we are out here in Detroit. I never saw anything to compare with the amount of business activity now going on, and I get similar reports from Cleveland. All of this makes it quite hard to get the fellows to give much outside time. Our monthly luncheons, which are held the first Wednesday in each month at the Detroit Board of Commerce, are quite popular, however. About seventeen fellows, for instance, showed up at the October luncheon.—*D. V. Williamson, '10, Secretary-Treasurer, Detroit Edison Co., Whitney Bldg., Detroit, Mich.*

Activity in New York

Under the presidency of Ralph Howes, '03, the Technology Club of New York continues to progress and plans for the coming winter would indicate that interest has gone higher than ever before. One of the principal aims of the club is to be of assistance to the younger members. They are encouraged to join the club at a lower fee than the older members, and they are assisted in every way possible. The Business Opportunities Committee of the club has made this work a very effective feature. They have always had at their disposal a large number of openings and a great many connections have been made for Tech men through this instrumentality.

Within a very short time the club will publish the second business directory of its members, and the issue is looked forward to with much interest.

By the simple plan of inducing a large number of members to advance \$5 on account of working capital, purchases can now be made at a much lower figure and expenses be materially reduced.

The announcement is made that the annual dinner of the club will be held at Hotel McAlpin, Saturday evening, January 27, 1917.

TECH MEN IN THE PUBLIC EYE

YGNACIO BONILLAS, '84, was appointed a member of the International Commission to adjust the differences between United States and Mexico. Mr. Bonillas has been acting a ssub-secretary of communications in public works of the *de facto* government of Mexico. After leaving Technology he became engineer and president of the Nogales Water Company at Nogales, Arizona. He next became mayor of Magdalena, Sonora; Governor of Magdalena district and mayor of Nogales, Mexico. Mr. Bonillas is a member of the American Institute of Mechanical Engineers, and is a very loyal supporter of Tech. A son, Ygnacio Safford Bonillas, chief geologist of the Copper Queen Construction Mining Co. of Bisbee, Arizona, is a graduate of the Institute in the class of 1908.

ALLEN B. MCDANIEL, '01, who recently resigned as assistant professor of civil engineering, University of Illinois, has become assistant professor of civil engineering, Union College, New York. After having practical engineering experience for five or six years, Professor McDaniel turned his attention to educational work, as instructor of civil engineering at the Case School of Applied Science. Afterwards he became professor of civil engineering at the University of South Dakota, and from there he went to the University of Illinois. He is author of the work "Excavating Machinery."

GEORGE E. HALE, '90, director of the Mount Wilson Solar Observatory, Pasadena, California, has been made chairman of the National Research Council formed by the National Academy of Science, at the request of President Wilson. The purpose of the Council is to bring into coöperation existing governmental, educational, industrial and other research organizations with the object of encouraging the investigation of natural phenomena, the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare. The Council consists of about one hundred of the most promising scientific workers in the United States, and under the energetic and able direction of Dr. Hale is not only fully organized, but is already beginning serious

work. The movement of which he is head is fundamental, and the results will be far reaching.

MATTHEW C. BRUSH, '01, who for the past six years has been vice-president of the Boston Elevated Railway Co., was recently elected president of that company to succeed General William A. Bancroft. Mr. Brush has given the greater part of his professional life to the operation and administration of street railways. In 1903 he became president of the Suburban Electric lines and remained in that position until he became general manager of the Buffalo Street Railway Co. in 1909. After one year in Buffalo he returned to Boston and became assistant to Vice-President Sargent of the Boston Elevated Railway Co. in 1910, becoming vice-president of the road soon after.

HOLLIS GODFREY, '98, president of the Drexel Institute of Philadelphia, has recently been appointed one of the seven members of the Advisory Commission to be associated with the Council of National Defense which was created at the last session of Congress. The men who make up the commission have won distinction in wholly different fields of activity, and are appointed because of special knowledge of certain lines of public utility or development of some national resource. The Council of National Defense was established for the coördination of industries and resources for the national security and welfare, and consists of six cabinet heads. In addition to the honor conferred upon him by President Wilson, Dr. Godfrey was recently elected one of the ten senators at the National Council of the Phi Beta Kappa Society at the annual meeting held at the University of Pennsylvania.

CHARLES SAVILLE, '06, formerly consulting engineer, New York City, who went to Dallas a year ago to take the position of director of public health in that city, has recently been appointed director of sanitation in the department of health. He will have complete jurisdiction over all matters affecting the health of the community, including the city hospitals.

WILLIAM GRANT, '14, consulting engineer, Lincoln, Nebraska, has been appointed associate professor of civil engineering, in charge of water supply and sanitary engineering at the University of Nebraska. Mr. Grant was a graduate of the University of Nebraska in 1897, and for ten years thereafter was connected with

the Chicago, Burlington and Quincy Railroad, afterwards having a private practice. He still claims connection with the firm of Grant & Fulton, civil engineers, Lincoln, Nebraska.

GEORGE F. SWAIN, '77, professor of civil engineering at the Institute, has been chosen to take charge of the valuation for the special commission that is making a study of the railways of Canada.

RICHARD C. TOLMAN, '03, recently connected with the University of California, has been appointed professor of physical chemistry at the University of Illinois.

ALLAN R. CULLIMORE, '07, professor of civil engineering, dean of College of Industrial Science, Toledo University, Toledo, Ohio, has been made dean of the Engineering School of Delaware College, Wilmington, Delaware.

WILLIAM G. LOGUE, '08, formerly of Brooklyn College, has been appointed professor of physics and calculus at Boston College. Father Logue entered the Jesuit Order nine years ago. He has taught one year at Brooklyn College, and two years at Georgetown University.

DEWITT M. TAYLOR, '06, formerly instructor in mechanical engineering at the Institute, has been made assistant professor in the mechanical engineering department, College of Technology, Maine State College, Orono, Maine.

Notice

We printed an ample supply of the July number of the TECHNOLOGY REVIEW containing a full account of the Reunion. Although this is larger than a double number the price is the same as usual, thirty-five cents. The postage is, however, eleven cents.

Those wishing extra copies may have as many as they care to order.

MISCELLANEOUS CLIPPINGS

Technology's new plan to make itself part and parcel of six great industrial plants in as many American cities is the most remarkable development of the day. It will bind practice and theory, in the professional training of young chemical engineers, as tightly together as the Siamese twins. By the Institute's arrangements for the occupation of its vast new home on the Charles, the chemistry department had already been assured much enlarged quarters, where Professor Walker could conduct its work on a bigger scale and carry out several projects which have long been dear to his heart. Now the department is promised not one new workshop alone, but six more in addition, and these placed close beside great factories where the uses of chemistry in industrial operations are daily being exploited on a full commercial scale. Laboratories bearing the name of the Massachusetts Institute of Technology, with a professor in charge of each one, will grow up on the grounds of the New England Gas & Coke Company in Somerville, of a great paper mill in Bangor, of an electro-chemical plant at Niagara Falls, of a large cement company in Pennsylvania, and of a big chemical factory near New York. The site for the sixth has not yet been selected.

At these six stations the students, registered for the master's degree in Technology's new course of practical chemical engineering, will spend nearly all of one year out of the five which the school will require. Three and one-half years will be given to the usual training in Cambridge, and then the grand tour of American chemical industries will begin. Passing in rotation from one plant to another, the students will spend six weeks at each station. None can be missed for each of the factories connected with the different stations especially illustrates a different process in industrial chemistry. This scheme introduces into the preparation for chemical engineering the same practical features which it has previously been possible to embody in the training of mechanical and electrical engineers. By the installation of the necessary machines and apparatus Technology has long since given men in these branches opportunity to do full-sized practical jobs of the kind done in the factories. The same advantages have not been available for young chemists. After all, dexterity with a flask and a test tube does not create precisely the kind of self-confidence needed by the chemist who is working with twenty-five thousand gallons of acid as a digester.

Since the great plan for Technology's department of chemistry could never have been framed without the willing coöperation of the industrial

concerns which are to receive the new laboratories on their premises, it is important to consider what a sign of the commercial and manufacturing times their cordial assistance represents in America. Certainly the assisting companies cannot expect directly from the training which the students will get at their plants any sufficient economic return. They are evidently looking out on this whole progressive movement with wide-open and far-seeing eyes. Their appreciation seems clearly to be that the advancement of manufacturing industries in America does depend in the long run on the work of the experts in research. They are willing to help that advancement directly and indirectly. The companies may of course turn for assistance to the laboratories which Technology will erect on their grounds. Some other concerns are already expending as much as \$300,000 a year for their private laboratories. The Institute, its students, the companies, their industries, American progress and power, all get a boost from this new scheme for practical education which not the Imperial German Government itself, working in unison with all its imperial factories and all its imperial professors, has ever equalled or bettered.—*Evening Transcript*, Boston.

Technology students begin work in their new quarters today. The finishing touches are still to be added to some of the class-rooms and laboratories, but in all the essential particulars they are about ready for use. The delay in completing the new dormitory has been something of a disappointment, but for the intervening fortnight or so the Technology authorities have rigged up adequate sleeping accommodations in the other buildings. In spite of these minor mishaps, the progress that has been made upon this enormous plant during the last two years represents a remarkable achievement, reflecting credit not only on the institution itself but upon the Stone & Webster Corporation, which has had the engineering and contracting work in hand.

Let us hope that the young men who today enter Technology for the first time will realize that they are the harbingers of a new epoch in the Institute's history. They come to the place which in its equipment and facilities for scientific education is not surpassed in any land. They should strive to make their efforts worthy of the opportunity, for to whom more is given, from him should more and greater things be required. These stately buildings signify much. They are a testimony to the enlarged faith which the industries of this country are placing upon education in applied science. They are also a tribute to the confidence which the Massachusetts Institute of Technology has won in the minds of the whole people by years of ungrudging devotion to sound ideals of education, by the spirit of earnest work which has always pervaded the ranks of the student body and by the remarkable ability which the authorities

have shown in getting large results from limited resources.—*Traveler and Evening Herald*, Boston, September 25.

The plant of the Eastern Manufacturing Co. at South Brewer has been chosen by the Massachusetts Institute of Technology as one of five stations in the United States selected to give practical instruction to its advanced students in applied chemistry as related to the manufacturing industries of the country. Pulp and paper making will be studied at this mill. Choice of the local plant is a distinct compliment to the Eastern Manufacturing Co., as the plants chosen as stations have been selected as the most representative and most efficient in their lines.

**Bangor
M. I. T.
Plant**

This station will be known as Station A and others have been established.

Students selected for the station here will come to Bangor in relays, remaining six weeks. Parties will consist of from six to eight students under a special instructor who will remain at the Eastern plant permanently. The first party will arrive on February 1. When its course here is completed it will move on to one of the other stations. The course will run from February 1 to September 1.

The students will be granted the master's degree on satisfactory completion of work done in this course. Arthur D. Little, a member of the Technology corporation, and chairman of the visiting committee for the department of chemistry, originated it.

In charge of the work of the course is Professor William H. Walker, head of the Institute's department of chemical research.—*Express*, Portland, Me.

So good a sport as Job doubtless had his lighter moments and cracked his jokes with the best of them. True, history has been so strangely silent on this subject that few think of Job as frivolling over date and wine in some nomadic club. Yet, could he but look down from the bosom of Abraham (where all good Biblical Orientals go), how horrified he must be to find his name associated only with patience, boils, and wholesale family disasters—and then, pray picture the feelings of the lively Greeks if they knew how their temples have been run into the ground, how Attic designs for places of worship of the high Olympian gods have been made to serve as public schools, moving picture theatres, libraries, railroad stations, and summer cottages.

The versatile Greek architects in their Olympian retreat (presumably the refuge with Abraham is not open to dead Pagans) must be tearing their filets in rage over a posterity that has refused to realize that the inhabitants of Hellas did not eat their ice cream sodas in temple architecture, that they did not assist at the latest cabaret attractions imported from Babylon in the Sunday school room of the Parthenon which the

**The New
Technology**

ladies of the church had furnished with a new carpet from their Spring Bazaar.

The fortunes of the game have preserved the Grecian temple through 2,300 years of conquests and the ravages of time, just as the poet has preserved Job's heroic struggle. Job's lighter moments are unsung. The less formal relics of Greek architecture are with the snows of yesterday, which is why architects will insist on transplanting the Grecian temple intact into the widely differing needs of modern life—embedding Greek temple façades into Fifth avenue bank buildings somewhat after the manner of fossil dinosaurs in the stone.

All of which leads to the remark that a far more appreciative use of Greek architecture than is usual has been made in the new Massachusetts Technology buildings in Cambridge, where college opens for the first time this month. William Wells Bosworth, the architect, has created a great white, gleaming group of buildings which combine the beauty of proportion, the simplicity, and the dignity of Attic architecture with a practicality as complete as that of a button factory.

This group is not a blind copy of a Grecian temple, a thing as thrilling as are the local women's club meetings, where the near-cultural leader of the afternoon lifts her article from the encyclopædia, without even omitting the typographical errors. It is an elastic adaptation of classic ideals to the requirements of a definite case. A technical college is not a cloister where young men study philosophy in order suddenly to become ripe editorial writers on highbrow weeklies. A technical college is a busy, hustling institution where the youth of the land—a selected part of that youth—learns to make a living and learns to make that living quickly by acquiring a certain special equipment for work which the modern world must have done. The architect in the present case has never lost sight of this main requirement. A characteristic feature of the buildings, for instance, is that in spite of the impressive character of the main entrance no space has been sacrificed to a grand stairway. In the day of the elevator this palatial survival is clearly out of place in a working building with its full complement of lifts.

In short, the architect has made no attempt to conceal the purpose of the building. A structure which houses machinery for the study of hydraulic pressure, and provides within it an artificial brook and huge cranes, must not have precisely the exterior of the sanctuary of a golden goddess.

The spacious grounds lie by the Charles River basin on land which fifteen years ago was mud flats. In the very site, therefore, the merging of the practical and aesthetic is consummated. The new School of Technology is a connected group of buildings, two, three, and four stories high, clustered about a library which rises yet two stories higher. From

the river view the eye is unconsciously led by this increasing height to the great dome which is the dominant note of the composition. This dome looks down from a height of nearly two hundred feet. The central court, open to the river front, expands into two large, though minor, courts. These openings, with other courts interior to the building and not public, insure the lighting of the rooms, for light must flood every part of this factory for the training of young minds.

At a distance, viewed from the opposite shore of the Charles, the stately pilasters and columns suggest that an Isle of Greece may have risen from the mud flats of New England Cambridge, that the architecture of sunny Greece is flowering in this northern clime. But close up one can see the difference which adapts the southern architecture to the new environment. The walls between the pilasters are practically glass, and the Grecian-seeming pile is in reality a glorified factory. And, surely, a factory for the turning out of young trained minds may be permitted a certain glorification that might be out of place in one devoted to the making of shoes.—*Evening Post*, September 9, 1916, New York.

Of recent years, the principle that shop work should be taught as nearly as possible under practical commercial shop conditions has steadily gained ground. The reason for this has been, no doubt, the lack of proper teaching methods in many of the trade schools and manual training schools; hence, the conclusion was near at hand that shop work could not be taught in a trade school. Some schools tried to meet this objection by adopting a plan and organization similar to that of a commercial shop, and building a simple line of machinery, or by taking in repair work; but it is doubtful if they have been able to turn out all-around machinists by this means.

Teaching Shop Work At the Massachusetts Institute of Technology, a system of teaching shop work has been developed by Robert H. Smith, in charge of instruction, which disproves the idea that the principles of shop work should be taught differently from any other engineering subject. Shop work, according to the Smith method, should be taught in a systematic manner, just the same as mathematics, mechanics, or book-keeping, starting with the simplest principles and working up to the more complex, following all the time a set, predetermined course. This cannot be done in a shop where the apprentice must work on any kind of job that comes along, but must be done in a school shop, where the commercial feature does not predominate. This does not mean that the commercial side is ignored—far from it. Every piece of work given to the student in this shop course is timed, and the student is also informed of the standard time in which a skilled workman would complete it. This gives him a better idea of commercial requirements than would be possible in a trade school taking in repair work, where it would be impossible to determine the time

element correctly. In a training shop of the type described, with a set course, each student is taught every ordinary machining operation. In the so-called "commercial" trade school or in the actual commercial shop, there are dozens of operations with which he never comes in contact.

The experience of the Massachusetts Institute of Technology shops indicates that it is possible to teach a boy a trade in a much shorter time, if a systematic course is adopted, than would otherwise be the case; and as the plan developed by Mr. Smith becomes more thoroughly understood and appreciated by educators and practical shop men, it is likely that it will be generally adopted by trade schools.—*Machinery*, New York.

Arrangements have just been completed whereby the resources of the Engineering Foundation, under the auspices of the four principal national engineering societies, are placed at the disposal of the National Research Council, which was appointed by the National Academy of Science at the request of President Wilson. The object of the council is to coördinate the scientific research work of the country in order to secure efficiency in the solution of the problems of war and peace. The council was without funds until the Engineering Foundation, established to further scientific and engineering research, offered to place its resources at the council's disposal, including the services of its secretary, Dr. Cary T. Hutchinson, to act as secretary of the council. The offer was accepted and plans for immediate activities have been placed in the hands of an executive committee.

Dr. George E. Hale, director of the Mount Wilson Solar Observatory, is chairman of the council. Medicine is represented on the council by Dr. William H. Welch, president National Academy of Science; by Brig.-Gen. William C. Gorgas, surgeon general of the United States Army; by Dr. Simon Flexner, director of the Rockefeller Medical Institute, and by Dr. Victor C. Vaughan, past president of the American Medical Society. Chemistry is represented by Dr. A. A. Noyes, Massachusetts Institute of Technology, and Dr. L. H. Baekeland; physics by Dr. A. A. Michelson of the University of Chicago; and electricity by Prof. M. I. Pupin, Columbia University. Clemens Herschel, president American Society of Civil Engineers; John J. Carty, chief engineer American Telephone & Telegraph Company; Gano Dunn, president J. G. White Engineering Corporation; C. E. Skinner, director of the research laboratory of the Westinghouse Company, and Dr. W. R. Whitney, director of the research laboratory of the General Electric Company, are among those who will represent the engineering side of the council's work.

The important military aspects will be presented to the council by Maj.-Gen. William Crozier, chief of ordnance U. S. A., by Lieut.-Col. George O. Squier, chief of aviation, U. S. A., and Chief Constructor David W.

Taylor, U. S. N. Other branches of the government are represented by Dr. S. W. Stratton, director Bureau of Standards; Van H. Manning, director Bureau of Mines and Prof. Charles F. Marvin, chief United States Weather Bureau.

Other members of the council are: Dr. John A. Brashear, Pittsburgh; Dr. W. F. M. Goss, dean of engineering, University of Illinois; Dr. William H. Holmes, curator United States National Museum; Dr. W. W. Keen, president American Philosophical Society; Prof. E. C. Pickering, director Harvard College Observatory; Charles F. Rand, president United Engineering Society; Prof. Theodore W. Richards, Harvard University; Prof. R. A. Millikan, University of Chicago; Ambrose Swasey, Cleveland; Dr. Elihu Thomson, Swampscott, Mass.; Dr. C. R. Van Hise, president American Association for the Advancement of Science; Dr. Charles D. Walcott, secretary Smithsonian Institution; Dr. J. M. Coulter, professor of botany, Princeton University; Prof. R. H. Chittenden, dean Sheffield Scientific School, Yale University; Prof. Raymond Pearl, biologist, Maine Experiment Station, Orono, Me.; M. T. Bogert, professor of organic chemistry, Columbia University.—*Iron Age*.

An alumnus of the Massachusetts Institute of Technology, Hou Kan Chow by name, has invented a Chinese typewriter whose keyboard contains four thousand Chinese characters.

A Revolutionary Typewriter Although this typewriter fails by forty-six thousand characters to take in all the characters in the Chinese dictionary, there are only six thousand in ordinary use; so that four thousand should be about enough for all practical purposes. There is no doubt that the typewriter will be a great help to the Chinese business and professional men whose nervous systems can stand the strain of waiting for a Chinese stenographer to roam feverishly over the typewriter keyboard in search of a character whose location has been forgotten, or which isn't on the keyboard at all.

Hitherto, when a Chinese business man wished to write a letter stating that somebody's favor of the 23d inst. had been received and contents noted, and in reply would say that goods had been held up by labor troubles, but would be shipped as soon as possible, if not sooner, he was forced to call in a stenographer whose outfit consisted of a couple of dozen gross of sash-brushes and a bucket of camphorated ink. Placing several hundred yards of meat-paper on an easel, the stenographer would dip one of his brushes into the ink and proceed to paint full-length portraits of his employer's ideas, pausing occasionally to decorate the borders of the paper with a few imagistic forget-me-nots or a conventional string of sausages.

It is this laborious and prehistoric method of writing a business letter which Hou Kan Chow has aimed to do away with by means of his new

invention. It is hoped that the business college will soon begin to flourish in China, and that ere long the nimble-fingered Chinese stenographer, after a ten-year course in learning the four thousand characters which decorate the keyboard of the new Chinese typewriter, will be ready to gladden the heart of the Chinese business man by taking his Chinese dictation in Chinese shorthand and transcribing his business correspondence on 8 x 11 typewriter paper at the rate of three thousand nine hundred and ninety-nine mistakes per diem.

The American business man, who knows how difficult it is to obtain a stenographer who has mastered the twenty-six-letter alphabet and doesn't write "beleive" and "judgement," and how nimbly she leaps from stenography to matrimony after he has obtained her and moulded her to the needs of his business, will be able to appreciate the joys which are about to fill the lives of the Chinese business men who must put up with stenographers who try to chew gum, burn a couple of joss-sticks, remember what their partners said at last night's dance and work the touch-system on a four-thousand-word typewriter keyboard at one and the same time.

China has had some serious troubles in the past, but those which lie before her make all the others look pale.—*Life*.

In the person of Eli Forbes, this town has as a resident the man who was the first matriculated at the Massachusetts Institute of Technology and a member of the first class to graduate. Mr. Forbes took a course in chemistry, at M. I. T., and, upon his graduation, was employed for many years as chemist by the Lancaster Mills of Clinton. He retired about ten years ago. At present he is president of the Clinton Savings Bank, is clerk of the Clinton Hospital Association and of the Home for Aged People and also president of the Runaway Brook Golf Club, in which sport he takes much interest. His father was Franklin Forbes, who was for a long period the agent of the Lancaster Mills, and one of the leading citizens of Clinton. Mr. Forbes sister, Evelyn, is the wife of Col. John E. Thayer of this town and Boston. He is now in his sixty-seventh year.—*Post*, Worcester, June 17, 1916.

William R. Peyton, representative of the Boston Tech Alumni Association of the Head of the Lakes at the reunion in Boston last June, gave a detailed report of the gathering at a dinner in the Kitchi Meetings in Gammie Club last evening.
Duluth

Following the dedication of the \$2,500,000 building an endowment fund was created that swelled to \$1,000,000 in a few minutes, Mr. Peyton told the members of the association last evening. The first contribution was made by Gen. T. Coleman du Pont, the powder magnate, who gave \$500,000.

About 6,000 alumni and their friends attended the three-day reunion,

which included a banquet for 1,000 women and a program of long distance telephone addresses as the closing feature of the gathering.—*Duluth Herald*, September 21, 1916.

Your readers, who have been trying to arouse the country to a realization of the importance of scientific training, will perhaps be interested in what America is doing in this direction through its leading technical school, the Massachusetts Institute of Technology. To a large degree it is with the young men trained in this institution that the best brains of the British manufacturer will have to compete in the markets of the world during the long period of reconstruction after the war.

American Technical Education

With its entrance this spring into a new home in Cambridge, Mass., the Institute enters upon a new phase of its existence, carrying with it many ideas that will bind together practice and theory in training of young engineers. Its new plan will make it part and parcel of six great industrial plants in as many American cities. By the occupation of its vast new quarters on the "Charles," the Institute's chemical department has gained not one but six new workshops, and these placed close beside great factories where the uses of chemistry in industrial operations are daily being exploited on a full commercial scale. Laboratories bearing the name of the Institute, with a professor in charge of each one, will grow up on the grounds of a large coke and gas company near Boston, of a great paper mill in Maine, of an electro-chemical plant at Niagara Falls, of a large cement company in Pennsylvania, and of a big chemical factory near New York. The site for the sixth has not yet been selected.

At these six stations the students registered for the master's degree in the Institute's new course of practical chemical engineering will spend nearly all of one year out of the five which the school will require. Three and one-half years will be given to the usual training in Cambridge, and then the grand tour of American chemical industries will begin. Passing in rotation from one plant to another, the students will spend six weeks at each station. None can be missed, for each of the factories connected with the different stations especially illustrates a different process in industrial chemistry. This scheme introduces into the preparation for chemical engineering the same practical features which it has previously been possible to embody in the training of mechanical and electrical engineers, for by the installation of the necessary machines and apparatus the Institute has long since given men in these branches the opportunity to do full-sized practical jobs of the kind done in the factories. The same advantages have not in the past been available for young chemists, who no doubt have found that dexterity with a flask and a test tube does not create precisely the kind of self-confidence needed by the chemist who is working with, say, 25,000 gallons of acid in a digester.

Since the great plan for the Institute's department of chemistry could never have been framed without the willing coöperation of the industrial concerns which are to receive the new laboratories on their premises, it is important to consider what a sign of the commercial and manufacturing times their cordial assistance represents in America. Although these assisting companies cannot expect directly any sufficient economic return from the training which the students will get at their plants, they are evidently looking out on this whole progressive movement with wide-open and far-seeing eyes. Their appreciation seems clearly to be that the advancement of manufacturing industries depends in the long run on the work of the experts in research, and they are willing to help that advancement directly and indirectly, for in the long run it will benefit not only themselves, but also the industries, the students, the Institute, and American progress and power.—Letter in the *London Times, Engineering Supplement*.

The memorable transfer of the Massachusetts Institute of Technology from Boston, over the Charles river to Cambridge and its new and admirable buildings, marks without doubt the greatest event of pageantry on a lofty scale that Boston, if not the country, has ever witnessed. Above the features that can be analyzed, such as the wonderful costume and color effects, largely from the mind of C. Howard Walker, looms a greater thing, a sort of immanence of immortality which all felt who witnessed it, the certainty of the unseen as expressed in the symbol and emblem of the vast effort at illustration so successfully carried out.—*Arts and Decoration*, New York.

BOOK REVIEWS

ANALYTIC GEOMETRY. By H. B. Phillips, Ph.D., Assistant Professor of Mathematics in the Massachusetts Institute of Technology. Pages viii+198. Price 6s. 6d. net. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd.

As an introduction to the differential calculus this text-book is of considerable value. Discarding the masses of formulas that at the outset of study would be only confusing, and, indeed, are of doubtful utility to the student who does not regard mathematics as an end in itself, but rather as a detail of professional training, the author expounds in clear and simple language, and illustrates by means of practical applications, the principles which must be mastered and the methods of applying them. Copious exercises are given, and the solutions to them are appended at the end of the book, which is therefore the more valuable to the student who has not the advantage of attending a class. The manual is a safe and sound introduction to its subject, and, indeed, to the science of mathematics generally.—*Architects' and Builders' Journal*, London, Eng.

THE NEW ENGLAND CONSCIENCE WITH TYPICAL EXAMPLES. By James Phinney Munroe, '82, M. I. T. Boston: Richard G. Badger. Cloth. 219 pp. Price, \$1.25.

Mr. Munroe is one of Boston's institutions. No one is more ardently devoted to the public good. No civic movement is complete without his counsel on the committee. No civic, socio-economic or literary club is adequate that does not number him among its members and no layman in New England has written so much that is so radically progressive educationally as has he. Always wielding a brilliant pen, he has never done anything so literary as is "The New England Conscience," of which he writes charmingly and then demonstrates with essays on Samuel Adams, Josiah Quincy, Theodore Parker, Shays' Rebellion and the Destruction of the Ursuline Convent. Here are sample sentences characteristic of the style and spirit of the book. "The old New England conscience was an admirable selective force, picking out the ruggedest from the English stock, strengthening it by a fight against the wilderness, proscribing from contact with it all idleness, ungodliness and frivolity. A good means to an important end, but in itself an ill-favored thing. Economizing and concentrating the forces necessary to found America, it was narrow as avarice, morbid as egoism."—*Journal of Education*.

HUMAN PHYSIOLOGY. A Text-Book for High Schools and Colleges. By Percy Goldthwait Stiles, Ph.D., M. I. T., '97; Instructor in Physiology, Harvard Medical School; and in Biology and Public Health, Massachusetts Institute of Technology. 405 pp., illustrated. Philadelphia: W. B. Saunders Company. 1916.

The successful teaching of physiology is difficult; to the properly trained teacher it seems indispensable that students should come to him only after thorough training in physics, chemistry and biology. To make such a demand is in many cases

unjust and impractical; crowded curricula in school and college interfere, and for the more mature general reader there is neither time nor inclination to make up deficiencies of preparation. Much will always be unintelligible to students thus hampered, but a great deal remains which can be made plain. The exigencies of daily life and the disorders of his own body have taught the average individual much practical physical, chemical and anatomical knowledge and have forced on his attention queries which physiology must answer. Dr. Stiles builds definitely on this foundation and his book is a demonstration of how surprisingly large the accomplishment may be. Attention is gripped and points fixed tenaciously in memory by constant use of striking phrase and clever illustration; "It (the colon) serves as a retriever of water," "People in a dusty place are acting as vacuum cleaners," etc. Where such teaching devices are impossible and formal presentation and discussion become necessary Dr. Stiles' command of the tools of expression and exposition make his treatment unusually clear and compact. The serious student will find his thought constantly challenged and stimulated by the amount of information and new insight which each paragraph will yield on careful reading. Such careful reading is necessary; no attempt is made to encourage indolent perusal; neither is space taken to elucidate matters which it would be desirable, but not essential, that the student should know. He will find, therefore, that his lecture notes and reference books repay frequent use as he reads.

The book fulfils a broader function than that of imparting physiological information, a function difficult to perform in an elementary text-book and only infrequently accomplished; namely, the creation in the student's mind of the critical attitude toward scientific knowledge, of the desire to experiment and observe for himself. The constant temptation in both teaching and learning is to pay attention to statements of fact only, and the student is likely to be dissatisfied, at first, if the subject is presented in any other form. Stiles habitually employs phrases such as these, "Some investigators hold . . . , " "We shall probably be right if . . . , " "We are left somewhat in doubt as to . . . , " and the like. If the student acquires the habit of taking that sort of attitude toward knowledge and theory the use of the book has been justified, though the subject matter should promptly pass from memory. The chapters on hygiene are written in a similar spirit. A regrettably large portion of the public demands a categorical answer when it asks, "Do we eat too much meat?" "Should we use drugs?" and similar questions. Stiles emphasizes throughout, by direct statement or by implication, that what is one man's meat may be another's poison and that to answer such questions as the above without reference to the individual is a dangerous error. One is stimulated instead to examine his own make-up and prescribe for himself. For this reason older readers who have had questions of personal hygiene thrust upon their attention repeatedly and often unpleasantly will be likely to find these chapters the most interesting and suggestive in the book.

Many original drawings are included which have the same characteristics of simplicity and clearness as the text.—Eugene L. Porter, Medical Laboratories, University of Pennsylvania, Philadelphia, Pa.

TEXT-BOOK OF ADVANCED MACHINE WORK. By Robert H. Smith, Instructor in Mechanical Engineering, Massachusetts Institute of Technology. Boston: Industrial Education Book Company, 1915. 8vo.; 575 pp.; 609 illustrations. \$3.

There is a scarcity of text-books on this subject that are at all comparable with those of other arts and sciences. This text has been adapted by the author to follow his "Principles of Machine Work," and it presents logically and progressively, engine lathe work, cutting tools and measuring instruments, and the use of the lathe in such operations as turning, fitting, threading, chucking and reaming. Perspective and mechanical drawings graphically illustrate the mechanisms, the tools, and the methods. That efficiency may be developed, a schedule of operations is given which provides a complete plan in table form for the rapid production of standard work in machine construction. For the student this book provides a complete, well-arranged and well-presented treatise on modern machine shop practice; to the instructor it offers an organized course, not merely in basic operations and processes, but also in scientific efficiency as applied to those operations and processes.—*Scientific American*.

THE POETRY OF GIACOMA DA LENTINO: SICILIAN POET OF THE THIRTEENTH CENTURY. Edited by Ernest A. Langley, Professor of French in the Massachusetts Institute of Technology. Cambridge: Harvard University Press. \$1.50.

The Notary Giacomo Da Lentino has found in Professor Langley a well-equipped editor. Thanks to his labors a complete critical apparatus has been placed at the disposal of the reader. The discernment shown in winnowing the undisputed *canzoni* and sonnets from those of doubtful authenticity, the commentaries, notes, the various readings of the poems show at a glance how thoroughly every field of scholarship has been searched and harvested. If the succeeding volumes of the "Harvard Studies in Romance Languages" equal the present one in painstaking care and broad knowledge of texts and sources, they will be a genuine contribution to the literature of the subject.

As to Da Lentino's poetry, it is not of the highest moral or literary standard. Giacomo belonged to the Siculo-Provençal School of the age of Frederick II. Besides Giacomo it counted among its singers Frederick himself, Enzo King of Sardinia, Pier delle Vigne, Odo and Guido delle Colonne, Jacopo d'Aquino and Rugieri Pugliese. With a few exceptions, these men lacked originality, power and genuine feeling. They confined themselves to a lifeless imitation of the Provençal School, which had outlined its full splendor and was rapidly approaching decline. Giacomo Da Lentino now and then sings in a sincere, heartfelt and simple strain, but he lacks depth, variety and vigor. He has, with a single exception, but one chord to his harp, and on that he incessantly thrums the pangs of his despised love. His first poem, "Madonna dir vi voglio," is a summary of all he has to say. He tries to express his love for his haughty and disdainful lady. While the poems of the Notary are free from the grossness not uncommon in medieval poetry, Catholics cannot approve of the misplaced affections which they at times seem to justify.—J. C. R. in *America*.

WATER-WORKS HANDBOOK. Compiled by Alfred Douglas Flinn, M. Am. Soc. C. E., Deputy Chief Engineer, Board of Water-Supply, New York; Robert Spurr Weston, '94, M. I. T., M. Am. Soc. C. E., Assistant Professor of Public Health Engineering, Massachusetts Institute of Technology, Consulting Sanitary Engineer; and Clinton Lathrop Bogert, Assoc. M. Am. Soc. C. E., Assistant Engineer, Board of Water-Supply, New York. New York: McGraw-Hill Book Co. Leather; 6 x 9 in.; pp. ix + 824; 411 illustrations. \$6 net.

Recently two very notable publications on sanitary subjects have been presented to the engineering profession. The first of these was the three-volume work by Metcalf and Eddy, "American Sewerage Practice," and the second is the "Water-Works Handbook" just out under the authorship of Messrs. Flinn, Weston and Bogert. To those who knew of the forthcoming of this book its appearance was awaited with an eagerness that was found not to have been misplaced when the book was at length received.

To those water-works men who know of the book only from press notices that have appeared since its publication it may be said safely that it is a working tool which fills a long-felt need in its particular province. This book is unique in its presentation of water-works facts, and many of the data contained, especially in the first and middle parts of the book, are from original sources and now available for the first time.

It is a practical book for practical men, compiled with care by able practicing engineers. It is not a textbook in any sense of the word, and yet no college technical course in sanitary science can now be complete without frequent reference to the facts and data which have been taken so generously from the personal notebooks of the authors.

As a general proposition the word "handbook" means a collection of heterogeneous data which often are thrown together with little attempt at classification and slight explanatory matter to aid in their application to special problems. This phase is noticeably absent from the present book, and he who reads carefully will find something here to aid in almost any difficulty.

The book is divided essentially into three principal sections—First, "The Supply of Water"; second, "Its Distribution to Consumers"; and third, "Its Treatment To Provide a Safe and Clean Water."

In the first section there are three parts—Part I. "Sources," comprising chapters on "Rainfall," "Evaporation," "Runoff and Ground Water"; Part II. "Collection," with chapters on "Intakes," "Watershed Development," "Reservoirs," "Dams of Masonry," "Earth and Rock Fill," "Wells" and "Infiltration Galleries" and "Notes of Equipment for Treating Water"; Part III. "Transportation and Delivery," containing chapters on "Open Channels," "Aqueducts," "Metal, Wood and Concrete Pipes."

In the second section there are twelve chapters devoted to "Cast-Iron Pipes," "Distribution Systems," "Valves, Gates and Hydrants," "Service Meters," "Pumps and Pumping Stations," "Distributing Reservoirs," "Standpipes and Tanks," "Water Consumption," "Hydraulic Computations," "Masonry and Puddle," "Nonferrous Metals," "Corrosion of Iron and Steel," "Conversion Tables" and a "Miscellany" of unclassified general data.

The third section, which is given over to the "Character and Treatment of Water," contains nine chapters—"Character of Water," "Inspection of Sources of Supply,"

"Storage of Water and Improvement of Reservoirs," "Sedimentation," "Aëration and Chemical Treatment," "Water Softening," "Preliminary Filtration and Deferrization," "Filtration" and a final chapter on "Examination of Water."

In general, the first section, comprising 378 pages, contains data of remarkable value; the second section of 265 pages includes much useful information very well arranged; the third section of 160 pages in comparison with the others is rather disappointing in that the chapters are brief and either omit or only mention some of the newest thought in water-works treatment.

As a whole, the subjects of the chapters are well selected and logically arranged. The book is thoroughly and carefully indexed in 21 pages, references to more extended treatment of subjects are freely given, the diagrams generally are well chosen and drawn, and the tables are excellently compiled. The book appears in attractive semi-flexible covers; the printing and paper have been chosen with care to avoid fatigue to the eye.

Many of the data undoubtedly could be found elsewhere in special treatises, technical publications and in reports after more or less patient search. So far as the reviewer is aware, however, there is no other book that so logically gathers together this matter and presents it in such great detail, stripped of non-essentials, ready for use by the busy water-works practitioner.

With a book so varied in its subject matter it is possible to give only the briefest survey of its contents. Beginning with the subject of rainfall, statements are made of general applicability, followed by tables of selected long-term rainfall and temperature records covering the entire country. These are amplified by diagrams showing typical relations between intensity and duration of rainfall under maximum rates.

The subject of evaporation is well treated, giving usable data based on results from various parts of the United States, and includes much new matter from recent Weather Bureau research.

In the chapter on runoff great stress is laid on the necessity for proper data, and the principal requirements are shown. The rather long description of current-meter mechanism could well have been replaced by a very brief statement and a sentence or two added concerning the several types of meters and their special applicability. The subject of watershed development is exceedingly well treated and contains a vast fund of very useful information.

The chapter on masonry-dam construction is particularly valuable on account of the data drawn from the exhaustive studies made for the work of the New York water-supply. Especial mention may be made of the information presented on the effect of upward pressure and ice and temperature effect. Dams and weirs on porous foundations are treated in some detail, much of the matter being drawn from the admirable monographs of W. G. Bligh on this same subject. The chapters on earth and rock-fill dams seem hardly to have received as much attention as could be desired, in view of the importance of such structures in ordinary water-supply development.

The chapter on wells is particularly full and brings into convenient form much very useful information that might be easily overlooked in a casual search. The chapter on infiltration galleries is rather brief, but the references are particularly complete and undoubtedly give adequate details.

The chapters on the transportation and delivery of water are very well written

and crammed full of data and information. The investigation work along the lines of this subject by the New York Additional Supply Board was especially complete, and the results here given will be highly appreciated by water-works designers.

The chapter on plate-metal pipes might with advantage have included more data on durability and conditions under which such pipes can be used to best advantage. The chapter on pumps, pumping stations and equipment is excellent, and the data given are quite complete.

The chapter on hydraulic computations is especially rich in ready-to-use diagrams and tables for solving ordinary water-supply problems, as well as giving exceptional data for advanced investigations. Much valuable information is brought together in the chapter on nonferrous metals, and the paragraph on the cracking of brass or bronze especially is of timely interest.

The third section of the book, on "Character and Treatment of Water," brings together in usable form much information hitherto scattered in many places. The data in the chapters on character of water, storage of water and improvement of reservoirs are of particular value in their references to American water-supply.

The chapter on aëration and chemical treatment is quite complete, as is also that on water softening. The chapter on filtration is rather brief, the most useful data being the cost of various plants and methods of operation.

To sum up, the "Water-Works Handbook" meets the needs of the designer of water-works systems and also contains most valuable information and suggestions for the water-works operator. The facts are stripped of technical detail and set down in plain language. It is not a treatise on water-supply, but is exactly what it purports to be, "a usable compilation of information, old and new, for the water-works engineer and superintendent, the designer, constructor, operator and inspector."

In its sphere it is undoubtedly one of the most valuable books on water-supply subjects which have appeared, and there is every reason to believe that it will be one of the "best sellers" from the technical press.—Caleb Mills Saville, in *Engineering News*.

PUBLICATIONS OF THE INSTITUTE STAFF

ROBERT PAYNE BIGELOW. Maturation. *Reference Handbook of the Medical Sciences*. Third Edition. Vol. VI, pp. 274-278. Illustrated. 1916.

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ROBERT PAYNE BIGELOW. Ovum. *Reference Handbook of the Medical Sciences*. Third Edition. Vol. VI, pp. 962-965. Illustrated. 1916.

JAMES H. ELLIS. The Free Energy of Hydrochloric Acid in Aqueous Solution. *Journal of American Chemical Society*. Vol. 38, pp. 737-762. April, 1916.

FRANK M. GRACEY. A Syllabus of Free Hand Drawing to accompany Adam's Lettering Plate. Vol. I, p. 65. Illustrated. Size $4\frac{1}{4} \times 6\frac{1}{2}$. Geo. H. Ellis Company, Boston. April, 1916.

SELSKAR M. GUNN. Public Health and Hygiene. *New York American Year Book*. P. 8. New York, 1916.

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W. V. LYON. Vector Notation. *Bulletin of the Society for the Promotion of Electrical Engineering*. Vol. VI, pp. 381-400, p. 20. Illustrated, Diagram.

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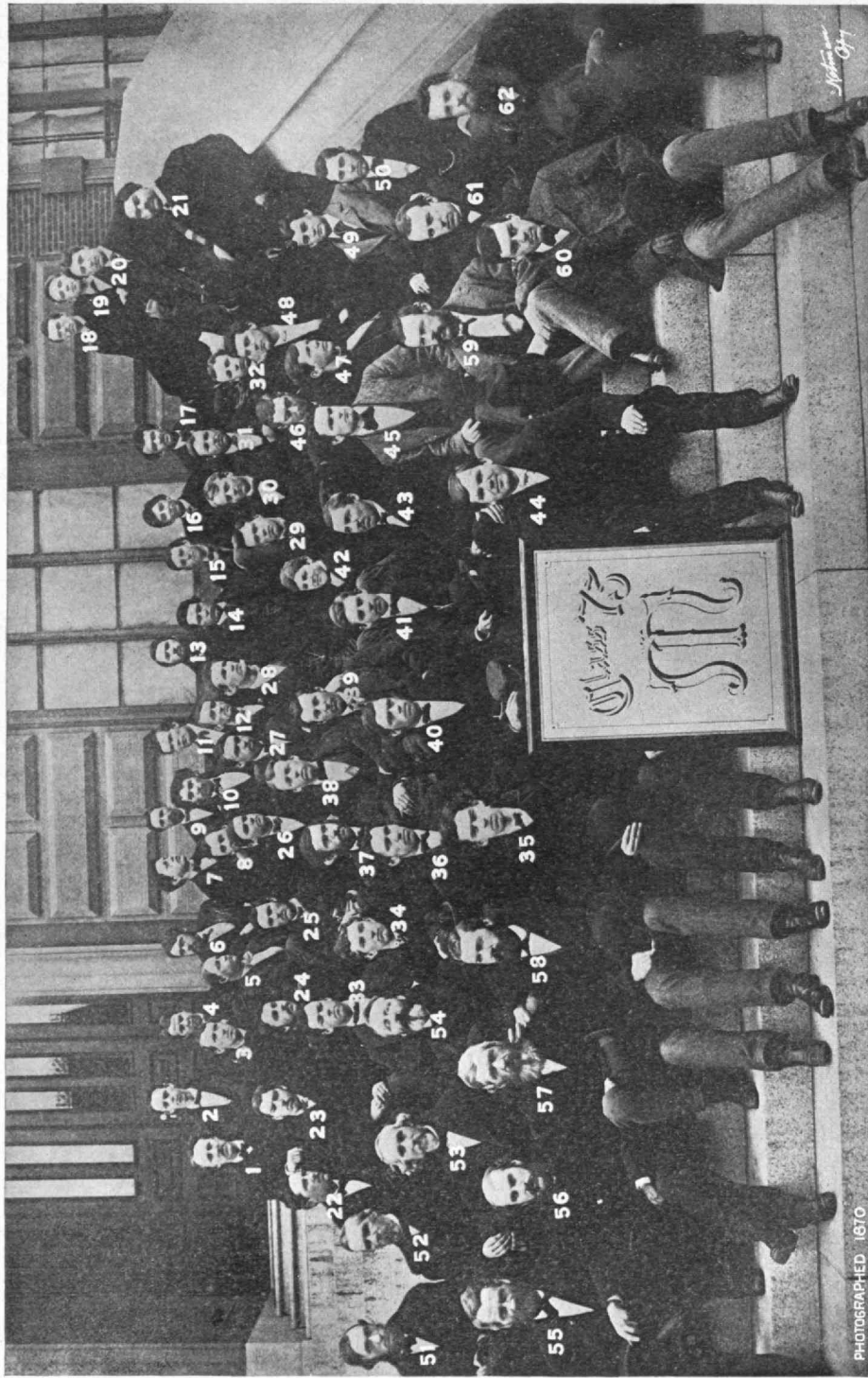
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AT SIX-THIRTY

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NEWS FROM THE CLASSES

1871.

EDWARD W. ROLLINS, *Sec.*, Dover, N. H.

From the Washington *Evening Star*, under date of October 4, we have the notice of Foster E. Beal's death as follows:

"Funeral services for Foster E. L. Beal, ornithologist in the Department of Agriculture, and Civil War veteran, who died at his home in Branchville, Md., Sunday, were held at the home at 10.30 o'clock this morning. Interment in Beltsville, Md., followed.

"Mr. Beal, economic ornithologist in the bureau of biological survey, was born in South Groton, now Ayre, Mass., January 9, 1840. He served with a Massachusetts regiment in the Civil War. In 1871 he received the degree of bachelor of science from the Massachusetts Institute of Technology. From 1870 to 1874 he was instructor of mathematics in that institution.

"From 1874 until 1875 he was assistant professor of mathematics in the United States Naval Academy at Annapolis, Md. In 1876 Mr. Beal was appointed professor of civil engineering, of zoölogy and of geology in the Iowa Agricultural College, holding those positions until 1883. In 1877 he married Miss Mary Louise Barnes.

"Mr. Beal came to Washington and to the Department of Agriculture in 1891. He specialized in economic ornithology and wrote a number of books on the subject. He was a member of the Biological Society of Washington and a fellow in the American Ornithological Union.

"Mr. Beal leaves a wife, one son, Kenneth Beal of Branchville, and a grandson."

1873.

SAMUEL E. TINKHAM, *Sec.*, The Warren, Roxbury, Mass.

The *Railway Review* publishes an interesting sketch of the activities of A. W. Johnston, as follows:

A. W. Johnston, whose appointment as assistant to the president of the New York, Chicago & St. Louis R. R., has been announced, was born in Boston, Mass., on March 4, 1853. He was educated in the public schools of Boston and the Massachusetts Institute of Technology and entered railway service in 1875 with the Pittsburgh, Cincinnati & St. Louis Ry. For three years he was clerk and draftsman in the general superintendent's office; from December, 1878, to 1880, assistant engineer; from 1880 to 1882, superintendent of the S. S. W. Co., and from January, 1882, to April of the same year, chief engineer of the Toledo, Delphos & Burlington R. R. For one year he was superintendent of the Leavenworth, Topeka & Southwestern R. R.; for five years division engineer and, from January, 1889, to October, 1893, superintendent of the eastern division of the New York, Chicago & St. Louis.

For thirteen years Mr. Johnston was general superintendent of that road, and from February, 1906, until his recent appointment he was general manager of the road. Mr. Johnston is a member of the American Society of Civil Engineers, American Railway Guild, and is past president of the American Railway Engineering Association. He also served on the executive committee of the American Railway Association and on its committee on car service, also on its committee on box cars. He is at present a member of the association's committee on standard time.

The following sketch of the life of Webster Wells, prepared by Dr. H. W. Tyler, is taken from the November number of the *American Mathematical Monthly*:

"Professor Webster Wells—long a member of the Faculty of the Massachusetts Institute of Technology—died in a private hospital near Boston, May 23, 1916. Born in 1851, Mr. Wells prepared for the Institute at the Allen School, West Newton, Massachusetts. He was graduated in civil engineering in 1873 and was then appointed instructor in mathematics. In 1880 he went to Germany for further study, spending two years in Leipsic, mainly in private mathematical work. Returning to the Institute in 1882, he continued teaching until his retirement on account of serious impairment of health in 1911. At the time of his return from Germany conditions were not yet favorable for the introduction of advanced or graduate courses, and Mr. Wells accordingly devoted his unusual powers of lucid exposition to the preparation and publication of an extended series of text-books in the whole field of elementary mathematics. The list includes: Academic Arithmetic, 1885; First Course in Algebra, 1908; Second Course in Algebra, 1909; Algebra for Secondary Schools, 1906; Text-Books in Algebra, 1906; Essentials of Algebra, 1897; New Higher Algebra, 1897 and 1899; Academic Algebra, 1885; Higher Algebra, 1889; College Algebra, 1890; Advanced Course in Algebra, 1904; University Algebra, 1880 and 1908; New Geometry, 1908; Essentials of Geometry, 1898 and 1899; Elements of Geometry, 1894; Complete Trigonometry, 1900 and 1911; New Plane Trigonometry, 1900 and 1911; New Plane and Spherical Trigonometry, 1896; New Six-Place Logarithmic Tables, 1878 and 1891; New Four-Place Tables, 1887 and 1900."

Still other works were published in coöperation with Miss C. M. Gerrish and Professor W. W. Hart. These texts represent an enormous amount of careful labor in a field already so long cultivated. They are in general notable for the clear and skilful arrangement of traditional materials rather than for any attempt at innovations.

Professor Wells was a member of the American Mathematical Society since 1895.

Outside of the field of mathematics, Professor Wells was especially interested in music and foreign travel; also early in life in mountaineering. He was for a short time secretary of the Faculty, and bursar of the Institute. He leaves a widow.

1874.

CHARLES F. READ, *Sec.*, Old State House, Boston, Mass.

Major Walter L. Bouvé has been on the Mexican border all of the past summer with the Fifth Regiment. It is not known when he will return to Boston. When he wrote to the secretary, he was "hiking" to Las Cruces from headquarters.—Emil Schwab wrote to the secretary recently in a reminiscent mood. It carries us back to the days when he was an architect in Boston and his remarks should prove interesting to Professor Cram's students in architecture and may also stir up the city of Boston to do some cleaning on its municipal buildings. He writes:

While taking a walk about the picturesque West End of Boston on Labor Day, I came upon a beautiful piece of architecture that I had never seen before, and I am certain that many thousands of citizens of Boston have never seen it. I refer to the Mayhew School on Chambers street. Whoever designed that structure had an exquisite perception of the delicacies of the early Renaissance, with the Gothic spirit still lingering among the neo-classic forms. But this lovely building is grimy and dirty beyond conception, and it seems to the writer that the municipal authorities of Boston would do well to redeem it from its present state. The expense would not be great and at the same time such a restoration might be an object lesson drawing the attention of that neighborhood to a greater appreciation of and respect for architectural beauty.

John C. Chase, our "Great American traveler," writes:

I made a western trip in July, calling upon Technology men in Detroit, Chicago, Milwaukee, Minneapolis and Duluth. I was lunched and dined by the M. I. T. associations in the several cities, and their members seemed to think that a visit from one of the Alumni Council was an event calling for recognition which they were glad to show. Visits from eastern M. I. T. men are certainly appreciated by those who have been away from their Alma Mater for several years.

Elliot Holbrook is looking after Federal Valuations of the Union Pacific System and Southern Pacific Company and operated lines in the interest of the roads. He is also a member of the Engineering and Land Commissions of the President's Conference Commission which is engaged in ascertaining facts and considering problems pertinent to the valuations required by the so-called Valuations Act.—William T. Blunt has his hands full of work, as the older assistant engineer of the Chicago District has resigned from office. Blunt writes:

Although the Chicago District is one of the smallest of the Great Lakes, River and Harbor Districts, it carries more "grief" than most others and requires considerable diplomacy and care to avoid entanglement with the many interests involved. The principal construction work just now is that of rubble mound breakwaters.

Joseph S. Emerson is still enjoying life at his pleasant home in Honolulu, Hawaii, and although not now engaged in business, is, to quote his own words, "never at a loss for something to do."—Edward R. Hamilton is now living in La Porte, Cal., where he is now "opening up" a new mine.—William F. Halsall, the eminent

marine artist, is hard at work on his new painting, "1630," which depicts the Winthrop fleet sailing into Massachusetts Bay. This will find a place in the Council Chamber of the Old State House in Boston, where the secretary of the class has his sanctum sanctorum. Mr. Halsall has about completed an arrangement with the United States government to acquire his great painting, "The Battleship 'Oregon' at Santiago." It will be placed in the Capitol at Washington.

1877.

RICHARD A. HALE, *Sec.*, Lawrence, Mass.

Benj. C. Mudge is with the main office of the United Shoe Machinery Company at Beverly, Mass. He is living near his daughter who was married to Charles R. Prichard, '05, who is superintendent of the Beverly Gas and Electric Company, and the son of the late Charles F. Prichard, '76. Mr. Mudge's second daughter, Madeline, was married May 3 to Harry G. Johnson, '99, who is located with the du Ponts at the Arlington Manufacturing Company, Arlington, N. J. The M. I. T. is fully represented in the Mudge family. His home address is 15 Atlantic avenue, Beverly, Mass.

1879.

CHARLES S. GOODING, *Sec.*, 27 School Street, Boston, Mass.

It is the sad duty of your secretary to announce the death of another of our classmates, Allan Murray Jenks, whom we all remember as such a good fellow and so full of fun in an original and dry way.

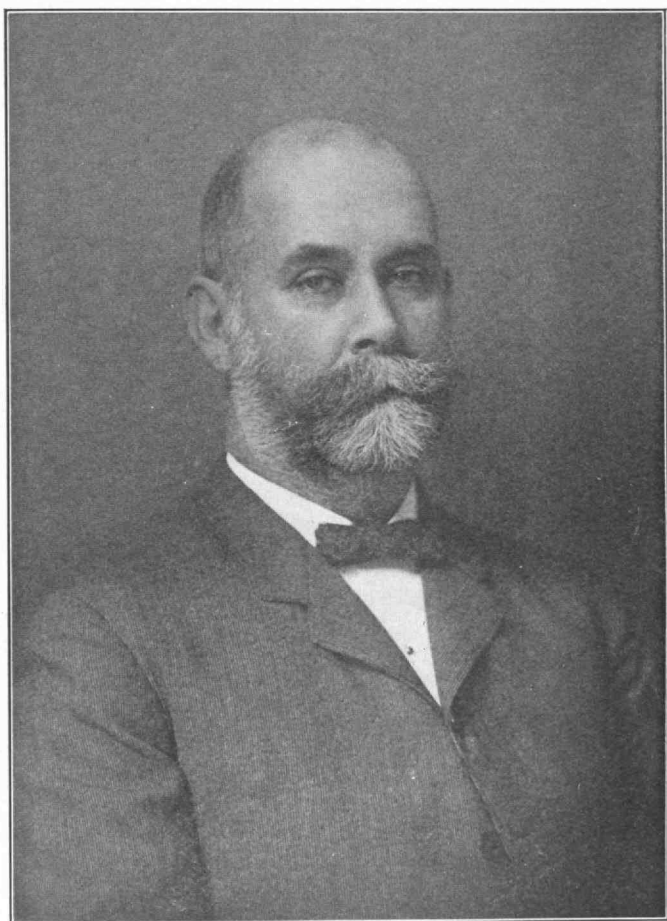
Allan Murray Jenks was born on April 17, 1858, at Lowell, Mass. He was for two years a regular student at Tech in science and literature. After leaving Tech he was for a while with the First National Bank of Concord, N. H.; then with the Concord *Daily Monitor*, leaving that newspaper in 1879 to go to New York with the firm of S. H. Brown & Co., coal dealers, with whom he stayed through a change of firm to Stickney, Conyngham & Co., until 1904, when the latter firm went out of business. Since that time Mr. Jenks did not engage in active business. He is survived by a sister and brother.

In January, 1916, the secretary received the following letter from Mr. Jenks:

A little run in with the grip has prevented an earlier reply to your official notice. As far as I can see and guess ahead you can count me in with the noble band for class dinner in June.

And in May, Jenks wrote as follows:

When I wrote you in January I meant what I said, as evinced by my subsequently engaging space at a hotel. But alas I have been sick, and am yet, as far as



JOHN ALDEN, '77

engaging in merriment is concerned, as my medicine man said, "You can go to Boston but you won't have any fun." So please cancel everything including reservations made at headquarters.

Your secretary was notified by Mr. William M. Rumney of New York of the death of Mr. Jenks in the following letter:

In going over some of the effects of the late Allan M. Jenks, I find a letter from you under date of May 24, 1916, regarding a class dinner of '79.

You will be sorry to learn that Mr. Jenks died on June 15 last after a comparatively short illness.

You have lost a classmate and I an old and valued friend.

1881.

FRANK E. CAME, *Sec.*, Metcalfe Apartments, Westmount, Quebec,
P. Q.

FRANK H. BRIGGS, *Asst. Sec.*, 10 High Street, Boston, Mass.

E. R. Warren writes that he was married in October to Miss Maude Bard of Colorado Springs, and hastens to add that he was not engaged when he was in Boston in June.

1882.

WALTER B. SNOW, *Sec.*, 136 Federal Street, Boston, Mass.

Since the pleasant luncheon at the Engineers Club in June to meet Harry Manning the secretary has been in quite regular and interesting correspondence with him. In his last Harry writes:

As the winter months come on I begin to think of the good times you boys are likely to have together, and I wish again that I was located in Boston. Maybe we will spend our later years there anyway, for Boston has all the good things of life and lots to spare. Remember me to any of the boys when you meet them.

Mrs. Richard H. Kennedy, who as Miss Clara E. Gill was associated with the class during 1879-80, is reported as now residing in Newberg, Ore.—The early days of *The Tech* were recalled on the evening of November 15 when Snow of the first Board, with Litchfield, '85, and other early members were the guests of the present Board at the banquet at the Vendome to celebrate the beginning of the thirty-sixth year of continuous existence. Unfortunately Walker was not able to attend. By the way, he included a trip to Alaska in his summer outing.—Charles A. French has recently changed his place of residence to Watertown, Mass.

1883.

HARVEY S. CHASE, *Sec.*, 84 State Street, Boston, Mass.

David Wesson, manager technical department, Southern Cotton Oil Company, has recently published figures concerning the wonderful growth of the cotton-seed oil industry in this country, as an illustration of the aid given by applied chemistry in producing a

valuable product from material which was at one time regarded as a nuisance.

Georgia had an oil mill in 1832 but it was many years after that before the industry came to its growth. In 1874, 5 per cent. of the total crop of seeds was used at a value of \$2,500,000. In 1884, 19 per cent. was used at a value of \$10,500,000. In 1890, 25 per cent. was used at a value of nearly \$20,000,000, and in 1915, 75 per cent. was worked for oil at a value of \$192,500,000. The number of factories has increased from seven in 1860 up to eight hundred and forty factories in 1915.

In the early days of the industry it was the practice to try to produce a very handsome appearing crude oil and beautiful, soft, golden yellow cake and meal. Apparently little attention was paid to the matter of yields. The mills producing crude oil were called "crude mills," and the word "crude" described them very well. The hulls were burned under the boilers, and the hull ashes were sold as fertilizer. The crude oil was shipped in all kinds of barrels, from new oak barrels to whiskey and varnish barrels. In fact, the writer remembers one instance where a barrel of whiskey was accidentally dumped with a carload of barrels of cotton-seed oil which were being emptied into a lard refinery, to the great grief of the workmen, who made the discovery too late. The refiner was at considerable loss to get the flavor of the whiskey out of the oil afterwards.

Whether it was the results of the numerous analyses made by the chemists at the Agricultural Experiment Stations which demonstrated the feeding value of cotton-seed hulls, or whether it was the animal instinct of the cows themselves, the fact remains that in 1888 the hulls, which were considered to have a fuel value equivalent to two pounds of hulls to one pound of soft coal, have for the last few years been selling at prices ranging from \$5 to \$10 a ton.

The great increase in the production of linters has been due to the heavy demand for guncotton and its products, caused by the present war. This increase is, therefore, directly due to the necessity for raw material in a strictly chemical industry. Linters are also used in mattresses, furniture cushions, absorbent cotton and batting.

The greatest work of the chemist in bringing the cotton oil industry to its present state of development has been along the lines of refining the oil. In the early days of the industry the product of the oil mills was known as prime or off crude oil, and was sold principally on taste and appearance. Along in 1890 the writer made it a practice to govern purchases by the percentage of free acid found in the oil, taking the same as the index of the fermentation which the seed had undergone prior to the pressing of the oil. The lower the free acid, the better the oil. This innovation aroused considerable opposition from the brokers and the oil mill men, some of whom strenuously protested that no free fatty

acid had ever come on their premises, and, therefore, could not be found in their oil. The amount of free acid present afterwards became naturally an index for the proper amount of alkali to be used in refining, and by careful selection of the crude oil considerable improvement was made in the ordinary yellow oils of that early period.

No article dealing with the chemical development of an industry can overlook the matter of by-products. In refining the oil, varying amounts of a material known as soap-stock are produced. In the early days of the industry the losses were enormous, 12 to 14 per cent. being not an unusual average, while at the present day losses do not exceed 9 per cent. for the average work of a well regulated plant. Soap-stock contains, besides the fatty acids neutralized in the process of refining, considerable quantities of coloring matter and oil. In the early days soap-stock was boiled up with caustic soda and sal and converted into a yellow soap much used by the woolen manufacturers. This was rather a soft soap, and by mixing proper quantities of tallow and rosin was converted into a low grade of laundry soap by many manufacturers. About 1887 it was worked into washing powder, and the "Gold Dust Twins" have been working hard at it ever since.

Another by-product to which attention should be called is the manufacture of hull fibre from hulls and from conversion of the same into cellulose. This depends also for success on the work of the chemist.

We can safely say that were it not for applied chemistry the farmer would not be receiving about \$192,000,000 a year for his seed; the world would not be receiving 4,000,000 barrels a year of edible oil, nor the excellent cooking fats free from all animal associations produced from it. We would be short a great many thousand pounds of first-class soap-making material and roofing pitch, all of which benefit the human race, while the cattle of the world would greatly miss the annual production of 1,500,000 to 2,000,000 tons of cake and meal and over 1,000,000 tons of cotton-seed hulls.

David Wesson was born in Brooklyn, N. Y., 1861. Graduated from Public School No. 11, 1877. Attended Brooklyn Polytechnic, 1877 to 1878; graduated from the Massachusetts Institute of Technology, 1883, with S. B. in chemistry; 1883-84, assistant to Prof. William Ripley Nichols; 1884-90, chemist for N. K. Fairbank Company, Chicago; 1890-95, chief chemist, American Cotton Oil Company at Guttenburg plant; 1895-99, president, Wesson Manufacturing Company, Cortland, N. Y.; 1890-1903, general manager, Wesson Process Company and chemist with Southern Cotton Oil Company; 1903 to date, manager Technical Department Southern Cotton Oil Company. Charter member American Institute of Chemical Engineers and Society of Cotton Products Analysts, of which he was the second president; member American Chemical

Society, Society Chemical Industry, Electro Chemical Society, American Association for Advancement of Science, Chemists Club, Technology Club of New York, Montclair Club and Sons of the American Revolution.

Wesson says: "Why publish the last paragraph? I am not dead yet."

1884.

HARRY W. TYLER, *Sec.*, Mass. Inst. of Tech., Cambridge, Mass.

It will be a matter of much interest to members of the class that Bonillas has been appointed one of the three Mexican commissioners to represent the Carranza administration in the conference recently inaugurated at New London. Bonillas is accompanied by his family and has found time for a brief visit to Boston and to the new Institute. We hope to see him again before his return to Mexico. Without expressing an opinion in regard to political relations, he assures the secretary that nearly all news about Mexico published in the American papers is distorted for political reasons. He refers to the New York *Evening Post* and the recently established *Mexican Review* as good sources of information.

Other recent visitors at the new Institute include Holder, Mellen, Lull, Bunce and Lyle. More would be welcome.

The secretary has recently represented the Institute at the thirtieth annual convention of the Association of Agricultural Colleges and Experiment Stations and Land Grant College Engineering Association at Washington, November 15-17. This session of the convention was of particular importance on account of pending legislation for the federal support of engineering research in connection with the land grant institutions.

An adjourned conference was held in New York with representatives of the National Research Council and certain state universities.

We publish the following from the *Mexican Review*:

Commissioner Ignacio Bonillas, the well-known civil and mining engineer who is acting secretary of the Department of Communications and Public Works, has furnished *The Review* with a very interesting but necessarily brief summary of the work accomplished by his branch of the government since he took charge of it under Constitutionalist control early in the revolution. Under his supervision are the railroads, postoffices, telegraph lines, port, harbor, and river improvements and other works of a public character. The actual operation of the railways is in the hands of a separate branch under the direction of Engineer A. J. Pani, also one of the members of the international commission. The head of the Department of Communications exercises advisory control over the transportation lines, both those owned by the government and those which are in private ownership.

Throughout practically the entire revolution Engineer Bonillas was kept busy in restoring the telegraph and postal services as rapidly as new territory came under control. Repair gangs went with the armies into the field, and the telegraph lines, which had for the greater portion been destroyed by the enemy, not once but many times, were repaired, restored and put into operation with as little delay as possible.

So closely was this work pushed that not infrequently civilians thus employed were killed or wounded by the enemy while engaged in their peaceful vocation.

At the present time there is complete telegraphic communication with all portions of the Republic, even the most remote, and this has been the case for many months. When the difficulties encountered are considered, the total destruction of equipment, the scarcity of suitable material for poles, and the remoteness from sources of supply, the promptness with which telegraphic communication has been restored and maintained is one of the most interesting features of the period.

One of the most important features of the work of Engineer Bonillas' department has been the establishment of a complete system of wireless telegraphy connecting all portions of the Republic, and acting as a safeguard against the cutting of the land wires by bands of marauders. The overwhelming importance of such a system was demonstrated during the revolution, and experts were accordingly dispatched to the United States for the purpose of securing the most modern appliances and inventions in wireless communication, and these have been utilized in the various centers of population.

The wireless station established at Cananea, Sonora, by an American copper company, is being operated by the government in connection with the remainder of its service, which is more than twice the extent before the revolution.

The land service, which has always been the property of the government and has afforded one of the cheapest methods of electric communication in any portion of the world, has been greatly extended since the Constitutionalist government obtained control, and many places have been given telegraphic communication which were neglected before that time. The entire country is now covered and the service is in a practically normal condition. This has been accomplished under great difficulties in many sections and the fact that the reestablishment of the lines kept pace with the occupation of even the most remote sections is a testimonial to the energy and resourcefulness of those in charge of this most important work.

The postal service was in especially bad shape when the Constitutionlists took charge of it. The personnel was topheavy, excessively costly and too frequently inefficient, and the service was far from what was demanded and was imperatively necessary. Under the new régime the delivery of mails has been carefully regulated, old and disadvantageous contracts have been abrogated and new and more advantageous ones entered into. Many new routes have been established and offices opened in places which in the past had never enjoyed postal facilities. The mails are delivered with greater frequency in all sections than heretofore, and while the force formerly considered essential has been materially decreased, with corresponding lessening of expense, much greater efficiency now prevails and the department was never in as flourishing and satisfactory condition as at present. The receipts of the service are rapidly approaching the highest point known before the revolution, although this feature was materially affected by the low gold value of the currency that was accepted for dues. All postage is now payable in Mexican specie, which tends to equalize the finances of the department. The international money order system has been restored and is now in complete running order, while settlement has been made of the deficiencies due other countries belonging to the postal union. Liabilities of this kind that accrued under the Huerta régime are the only debts of that usurpation that are recognized by the Constitutionalist government and this was only done because they were international obligations due the United States, Great Britain and other countries.

The lighthouse service of the country is a portion of the duty of the Department of Communications, and this too has been renovated and restored. Much of the machinery and equipment of the lighthouses had either been destroyed or removed by Federals and the buildings damaged. But this has all been remedied and mariners approaching the shore on either coast find the signals all in good order and worthy of entire dependence.

The improvement of the harbors of the country is under the jurisdiction of Engineer Bonillas and has occupied much of his time and personal effort. Of great importance is the deepening of the channel of the Panuco river and the dredging of a deep sea channel across the bar at its mouth, affording access to the great oil exporting center of Tampico. The jetties too at the mouth of the river had been

suffered to lapse into disrepair, but all this work of restoration and improvement is progressing rapidly. Next to Vera Cruz, Tampico is the most important seaport in the Republic, most of the business transacted there being in connection with the petroleum development, and the importance of the harbor for the accommodation of deep sea shipping is of the greatest. Arrangements for the improvement necessary are now under way and it is expected that upward of two million dollars will be expended in the task.

At Tuxpam, another important oil shipping port, in the Tampico region, dredging of the bar will be contracted in the near future and jetties and wharves will be constructed or are already under way. At Vera Cruz the harbor has been dredged, new and substantial wharves erected, and the port put into shape to accommodate any demands that may be made upon it by commerce.

On the west coast work is being prosecuted at Guaymas and Mazatlan. At the latter place it is in contemplation to dredge a channel for deep water vessels into the estuary and establish there securely protected wharves for the accommodation of the constantly increasing commerce of that port. The wharf which was destroyed while under Federal control is being rebuilt and other important works are projected. Work is being carried out at Guaymas and bids will soon be asked for extensive improvements there.

Taken as a whole the work that has been accomplished within a comparatively brief period under the direction of Engineer Bonillas is as interesting as it is wonderful, accomplished as it has been during a period of great financial as well as political, social and industrial stress, and is another of the many remarkable examples of the ability of Mexico to bring order out of chaos and to rehabilitate herself in the face of many adverse conditions. It is also a most remarkable and notable refutation of many charges that have been widely circulated and given credence regarding conditions in that country, as well as concerning the character of the men who are now in control.

1885.

I. W. LITCHFIELD, *Sec.*, Mass. Inst. of Tech., Cambridge, Mass.

Alex McKim was the victim of an accident about noon on November 11, and escaped instant death only by a miracle.

McKim is inspector of docks and dams for the State of New York, and was traveling in an automobile near Mooers Forks, about 25 miles from Plattsburg, in the northern part of New York State. He was traveling at a moderate rate of speed through a cut across which was a railroad track. It was impossible to see an approaching train in either direction, and just as he was crossing the track, a train, going at the rate of about forty miles an hour, struck the machine, and after the accident Alex was picked up one hundred and ten feet from the point on the highway where his car was struck by the speeding train. The car was a five passenger Ford belonging to the State. The front part of it was carried on the pilot of the engine to the next crossing. The other section where Alex was found, fell into a ditch. In its passage it tore a cattle guard of stout wood completely out of its foundations and left it a pile of débris.

Shortly after the accident McKim was taken to the Champlain Valley Hospital, at Plattsburg, and there he was looked after by his sister, Miss Emma P. McKim and E. H. Sargent, '07, assistant engineer of the New York State Conservation Commission.

Mr. Sargent writes that his only injuries, barring the slight abrasion on one knee, were on his head where there were two or three deep gashes, although his skull was not fractured. The shock to his nervous system was, of course, great; he remembers practically nothing about the accident, and it will probably be some time before he will fully recover from the shock. The attendant physicians do not think that there will be any permanent injuries. At the time this was written it was expected that he would leave the hospital soon after the first of December.

Charlie Eaton, with his usual enterprise, has taken up the matter of furnishing the Institute with one of the two flag poles which will adorn the lateral courts of the educational group, as a gift from the class of '85. The expense of the flag pole is about \$5,000. It is expected that one of the other classes will furnish the other flag pole, and as they are very conspicuous, the enterprise of the class through Eaton will be appreciated generally. A picture and description of this flag pole will be given in a subsequent number of the REVIEW.

When the Chamber of Commerce of Springfield elected Frank Page president they secured just the man that was needed to take hold of things with a strong and progressive hand. During his incumbency the Board of Trade has carried through several important enterprises, including the National Dairy Show, the Convention of City Managers, etc., all of the projects being of a character to put Springfield in the public eye in a very favorable way.

The class in under a debt of gratitude to Dick Pierce, first for devising the '85 stunt, which was presented at Nantasket in June and which was unquestionably the most impressive and startling one shown on that day, and second for making all the arrangements for properties, uniforms, etc. The work was naturally fatiguing, and he has only recently been able to sit up and make out a memorandum of expense, which he finds amounts to a little over two hundred dollars. A memorandum of this expense will be sent later to the members of the class with a request that those who can assist in defraying the bill will kindly do so. In view of the number of appeals that have come to us recently it is thought best not to take the matter up just at this time.

1886.

ARTHUR G. ROBBINS, *Sec.*, Mass. Inst. Technology, Cambridge, Mass.

It is with deep sorrow that the secretary reports the death of Lawrence Thacher at Atlanta, Ga., on October seventh.

After leaving the Institute, Thacher went West, where he was for several years engaged in railroad construction. He then returned to Massachusetts where he was employed as resident

engineer on the Massachusetts Central Railroad during construction. Leaving railroad work he opened an engineering office in Northampton, Mass., where he later became city engineer, a position that he held for ten years.

In 1902 Thacher went South where he was employed in electric railway construction in Birmingham, Ala., and Little Rock, Ark.

In 1905 he was resident engineer on the construction of the Florida East Coast Railroad along the Florida Keys.

Ten years ago Thacher went to Atlanta, Ga., where he has since been employed as engineer in the Roadway Department of the Georgia Railway and Power Company.

At the time of his death he was president of the Atlanta Section of the Engineering Association of the South.

Thacher married Miss Elizabeth Hervey of Northampton, Mass., who with one daughter survives him. He also leaves to mourn his loss an aged father and mother, Captain and Mrs. Edwin Thacher of Yarmouth, Mass.

1888.

WILLIAM G. SNOW, *Sec.*, 24 Milk Street, Boston, Mass.

William H. Blood has been appointed by Harvard University to take charge of the course on public utilities in the Harvard Graduate School of Business Administration. He will have several assistants in connection with this work.—S. E. Thompson has opened new offices and a laboratory in the Federal Street Building, Boston. His laboratory contains among other pieces of apparatus a concrete saw and a 125-ton compression machine, which make it possible to handle work of an original nature. Thompson's principal work is in connection with re-enforced concrete construction, the making of reports on materials, methods, and cost analysis and on economical plant operation.—Collins, Cole, Bridges and Snow joined the interesting A. S. M. E. trip to New London November 11 and witnessed the evolutions of United States submarines.

1889.

WALTER H. KILHAM, *Sec.*, 9 Park Street, Boston, Mass.

Gardner W. Pearson has been appointed by Governor McCall brigadier-general of the Massachusetts Volunteer Militia, to succeed Adjutant-General Cole.—George C. Whipple, professor of sanitary engineering at the Massachusetts Institute of Technology and secretary of the School for Health Officers, has been retained by the New York State Board of Health as adviser in the matter of the garbage nuisance on Staten Island. This is in connection with the private garbage plant erected despite the protests of many citizens, which is now being investigated by the state.

The *Boston Evening Transcript* of November 1 contains the following regarding Hollis French's collection of autographs:

Many Bostonians will learn with some surprise that the Hollis French collection of autographs, gathered by a Boston collector during many years, is to be sold at Anderson's in New York on Nov. 8. The collection is not a large one, but is interesting, and along with it will be sold some of The Century manuscripts and autographs and some important letters from private consigners. One of the most important offerings is an autograph letter signed by Count Frontenac, May 11, 1646, to his uncle, M. d'Humieres, announcing the successful assault on two forts. Holograph letters of Frontenac are exceedingly scarce, and this is of historical importance. Among the manuscripts are some by Ainsworth, John Burroughs, Rodman Drake, Bret Harte, O. Henry, Theodore Roosevelt, Mrs. Sigourney, David Warfield, Charles Dudley Warner and Walt Whitman. Among the documents signed are some by Jean Grolier, Margaret of Navarre, Marie Antoinette, Samuel Pepys and Abraham Lincoln. Autograph letters are by John and Abigail Adams, Jefferson Davis, Joseph Dudley, Robert Fulton, W. H. Harrison, General Knox, Henry Lee, Pickney, Sullivan, Wayne, and other notables. Among the literary celebrities represented are Charlotte Brontë, Carlyle, Clemens, Dickens, John Evelyn, Hawthorne, Johnson, Longfellow, Meredith, Poe, Whittier and many others equally well known.

1890.

GEORGE L. GILMORE, Sec., Lexington, Mass.

We note from the papers that "Chic" Waite, our city manager, of Dayton, Ohio, was a member of Company M, Ninth Regiment, at Plattsburg, during August. We presume "Chic" is getting up Ninety preparedness for the future.—The son of Schuyler Hazard was president of his class at high school in Albion, N. Y., and graduated last June.—Cabot J. Morse in August was in Bretton Woods, where his seventeen-year-old boy was covering himself with glory at golf. We would suggest that it might be well for Cabot to take a few lessons from his youngster before he tackles our secretary again.—The flash light photograph taken at our banquet at the Algonquin Club, as guests of Colonel Hayden, has been sent to all who were present, but if any of you did not receive a copy, kindly advise at once.—Colonel Hayden is a member of the committee for the relief of Massachusetts soldiers' families. In August and September he was on a trip to Alaska, investigating mining properties.—C. M. Foster of Toledo, Ohio, was operated on for appendicitis in June, and as a result was unable to be present at our Reunion.—In June, Harry Burley had a strike at his plant, the Boston Insulated Wire Co., in Dorchester. According to reports made, Harry refused to recognize the Union, but was perfectly willing to treat the employees as individuals.—At the meeting in June of the American Pneumatic Service Co., Atherton Loring was elected one of the directors.—The permanent address of Harry A. Kennicott is now 1221 Second Cross, Nebraska City, Neb.

The following article appeared in the Albion (N. Y.) newspapers soon after our Reunion:

Schuyler Hazard, '90, is proof that Tech can even go so far as to furnish mayors. He is mayor of Albion, N. Y., in the heart of the apple district, and during his term

of office has made use of his technical education by constructing a waterworks system, and of his natural tendency toward good works by building a hospital.

A good man never goes backward—a man with technical knowledge progresses.

As a mayor of Albion, Schuyler has certainly been a success. It was expected that the tax rate would jump to \$20 per \$1,000 but the final rate per \$1,000 is \$16.29, which is an increase of not quite 11 cents per \$1,000 over the previous year. Under his careful management and the Board of Trustees, in spite of the increased bond charges, every village fund shows a balance on hand, which is unusual at this time of year. Albion is to be congratulated, as it is practically impossible to find a village or city in the state with a tax rate of less than \$20, and many of them have tax rates of over \$30.

Among the mayors in the history of Albion, according to statistics, no one has done more to keep down the tax rate than has Mayor Hazard, and he certainly is deserving of high praise for what he has done thus far in keeping the tax rate down to a lower figure than was predicted a few weeks ago.

We are very glad to announce that Charles M. Watson is no longer a "deceased" member of the class of '90. Charlie showed up in Boston two days after the Reunion, having heard nothing about it. He had been kicking about the world, in Australia and the West, but is now located in New York with the Huber Hand Stoker Co., Inc., at 13 Park Row. Charlie is blessed with a wife and three children, and looks as natural as ever, except somewhat stouter.—William P. Flint's address is now Fairport, N. Y.—In July, deLancey was on an auto trip through the Adirondacks. The following article on our classmate, Darragh deLancey, appeared in the Waterbury (Conn.) *Republican* on August 12:

The Eastman Kodak Company, as everybody knows, requires astounding piles of celluloid and cellulose; which young and giddy chemicals replete with pep and hope employ the smallest chances to explosively elope, to rise in sudden blazes like Elijah to the sky, with ample entertainment for the few who linger nigh.

deLancey was a chemist at this perilous abode until some forty tons of stuff decided to explode. It baked the apples on the trees and carrots in the ground; and while some smaller employees were never seen or found, deLancey had a lot of time to plan for coming down, and when he struck the earth it was in Waterbury town.

Since that extremely vivid date, now many years away, he's been a resident with us and well content to stay. Resigned from sordid chasing of the grand and glossy scads, he likes to boost the brave Boy Scouts, those patriotic lads whose minds are filled with noble plans to save their country's flag while men of disillusioned years fight basely for the swag.

deLancey's well identified with Christian hopes and aims; in First Church works we find him known among the foremost names. If any new catastrophe should carry him so high he would not care to lose the time returning from the sky, we feel the reputation which he has established here would strongly recommend him in the famous upper sphere.

Darragh is evidently as lively a cricket as ever.—Harry L. Noyes is helping the Union Carbide Co., to prosper both at Niagara Falls and in Norway and Canada, his part being the engineering end of the business.—A. W. Woodman is running the Joliet Bridge & Iron Co., which has been very prosperous under his management. He is president of the reorganized company.—Pierre S. du Pont issued a statement in July to stockholders of the du Pont Powder Co., asking them to make a vigorous protest to Congress against the Revenue Bill. He says if the bill is passed in its present state

it would penalize the du Pont Powder Co. to the extent of all net profits between 1912 and 1914.

We are constantly hearing references made to the grand time that was had at the last Reunion, not only from members of our class but from many others. It is our regret that more of the fellows could not have been present, but we are looking forward to our thirtieth anniversary in 1920, when we hope to have a larger gathering of the boys with our wives, sweethearts, and offspring.—F. H. Dodge with his family were at the Rangeley Lake House, Rangeley Lakes, Me.—G. L. Gilmore and Mrs. Gilmore spent September at Kennebago Lake, Me., when fly fishing took the place of class secretary duties.

Charles Hayden of Hayden, Stone & Co., in an interview in Butte, said:

I believe we will see the copper, zinc and mining situation generally continue prosperous for some time to come. When the war started the zinc business of this country faced a shortage in smelting capacity that sent the price soaring. Now that difficulty has been overcome, and the smelting capacity for zinc has been increased to a point where the output of the zinc mines can be handled. It is the increase in the smelting capacity that has resulted in bringing the price of zinc back to normal.

I do not anticipate that zinc will go lower than its present price for some time to come, as the demand is good and the United States is furnishing the large part of the zinc output of the world. Copper ought to be in a good position, too, for a long time ahead. No one can tell how long the war in Europe will last and when it will end, but the United States will be in a much stronger position after the war than it was before it started.

Under date of June 24, we have the following announcement from a Boston paper:

In the presence of a few friends Leonard Chase Wason, president of the Aberthaw Construction Company of Boston, builders of the Harvard Stadium, married this afternoon Mrs. Annie Belle Redlon, the widow of Charles Redlon, of this city.

The wedding, which was a quiet one, took place at the residence of Mrs. Redlon, on Emery street, and the ceremony was performed by the Rev. Frank C. Erb, pastor of the Free Street Baptist Church. There were no attendants.

Mrs. Redlon has been socially prominent here for many years. She is a well known member of the D. A. R., a Daughter of 1812, and a member of the Women's Literary Union, and several other organizations. Her late husband was the president of the Ira F. Clark Clothing Company, of this city. Mr. Wason is an M. I. T. man. After the wedding the couple left for Canton, Mass., where they are to spend the summer.

Guy Emerson, who is consulting engineer to the Finance Commission of Boston, submitted to the Council in July recommendations for relieving the financial situation in many of the city's divisions. According to the Boston papers he is looking right after the Public Works Department:

In the ferry division he pointed out payments made for stevedoring on coal deliveries when the contract plainly specified that the price of the coal should include all stevedore charges.

In the street cleaning and oiling division, he pointed out a request for \$1,000 for moving buildings already moved.

In the sewer and water division he pointed out the loss of \$944.33 to the city by the lapse of a coal contract.

In several divisions he says the appropriation has been exceeded, and in some instances it appears that the expense may have been incurred in violation of Section 16 of the city charter, which makes it a criminal offense to exceed the appropriation under certain conditions.

The greatest reduction recommended by Mr. Emerson was in the sanitary division amounting to \$29,750. Of this amount \$18,000 could be saved, he said, if the superfluous employees pointed out in the original budget were dismissed.

In addition, \$10,000 could be saved, he believes, if the company under contract to remove the city's ashes had been obliged to live up to its contract. No serious attempt has been made, he said, to oblige this company to live up to its contract by making it use the Ward street refuse station in preference to the station on Southampton street. If this was done Mr. Emerson says he believes \$10,000 could be saved in teaming bills alone during the remainder of the year.

Referring to a deficit of \$398.62 in the sanitary division for repairs, Mr. Emerson says there appears to be no reason except political patronage why this work should not have been done at the department's shops, that are not overburdened with work.

In the ferry division, Mr. Emerson points out a request for \$220 to meet the increased price of coal. It appears, said he, that this sum was requested to meet an increase on coal already paid for and burned.

In the highway division he recommended a reduction of over \$10,000 for watering and oiling the streets as a result of the excessive rain that has fallen.

We presume that by this time you have all read the July issue of the *REVIEW* and all realize what a grand time Ninety had at the Reunion. Our only regret was that all could not have been present but we feel that the account of the Reunion, together with the photographs shown in the *REVIEW* will prove of interest to all.

The account of our reunion was written very hurriedly as the time for it was limited, but later perhaps we shall be able to add some more notes that will be of interest.

One thing most of you seem to have neglected. During the reunion, you may recall, your secretary asked you fellows to drop him a line in regard to the interesting incidents of the reunion that struck your fancy so that we would have more details in the future. Up to date not a single line has been received. Now, fellows, let us hear from you as the rest of the boys would like to know your ideas and views about the reunion.

All who were present at the dinner at the Algonquin Club, given by our class president, Hayden, received a copy of the flash-light photograph soon after. Recently a key to it was sent so that you can pick out the different fellows. If any of you did not receive this key kindly advise your secretary at once.

At the annual meeting of the "Daniel Webster Birthplace Association" at Franklin, N. H., in October, Warren F. Daniell was elected treasurer. Daniell was a member of the class in the freshman year.

At the opening of the Institute this year George E. Hale of our class gave a strong speech for scientific research and pure science, and made the following remarks:

It is necessary that we should all coöperate with this new National Research Council which has just been appointed by the President of the United States. The

principles which were set forth by the first President of this Institute, William B. Rogers, are the ones which are to guide us in the future. Those principles concern the interests of scientific research and pure science.

After returning from a trip to England and France I was impressed with the way the scientific men of those countries are responding to their needs.

When England was confronted, for instance, with a shortage of optical goods for which she had depended upon Germany, her scientific men went to work and studied and made an analysis of German glasses.

After the war we must meet competition. Our scientific men must give to the country the best that is within them and carry on research work. This is the best sort of preparation for national defence.

We want the spirit of national service which leads men to go to Plattsburg.

In science we must be prepared, and this Institute can do much along these lines in promoting results.

Mrs. W. Z. Ripley in October was elected a trustee of Boston University. Mrs. Ripley is a graduate of the College of Liberal Arts, class of '89.—Charles Hayden was elected as usual vice-president of the Boston Stock Exchange in September.—Charley Watson who has recently come to life again announces the arrival of a boy, John Henry Watson, on September 21, who tips the scales at ten and one-half pounds. Charley states that the boy is already bound for Tech and possibly one of his daughters. Charley was not aware of the young man's arrival until about two weeks after, as at the time he was born, Mrs. Watson was in Costa Rica safe from the infantile paralysis. Charley is now the proud father of three girls and one boy, the oldest being five years of age.

1892.

W. A. JOHNSTON, *Sec.*, Mass. Inst. of Tech., Cambridge, Mass.

C. H. CHASE, *Asst. Sec.*, Tufts College, Mass.

The following clipping was taken from the Boston *Transcript* of August 9, 1916, in regard to Miss Dodd:

"Miss Margaret Eliot Dodd, who had been well known as an educator, died on Tuesday at her home in Brookline, following an illness which had been prolonged throughout the past year, and which had caused her to relinquish her activities as a teacher.

"Miss Dodd was born in Cambridge in 1868 and was the daughter of the late Horace S. Dodd and Emily L. Dodd. She was a graduate of the Massachusetts Institute of Technology, class of 1892, in the department of biology, and at Tech had taken a leading part in the activities and interests of the Institute.

"She was for a time a teacher in the Woodward Institute in Quincy, later joining the staff of instructors at Miss May's School, and afterward she was for several years a teacher of domestic science at the Garland School of Homemaking, resigning from her position there about a year ago, when her health failed.

"Miss Dodd was made president of the Tech Woman's Association, following the death of Mrs. Ellen H. Richards, '73, M. I. T.,

who had been the association's president. Miss Dodd was a member of the Association of Collegiate Alumnae, the College Club and of the New England Home Economics Association, of which she was for a year the secretary. Miss Dodd is survived by two brothers, Walter S. Dodd, of East Corinth, Vt., and John W. Dodd, of Brookline, as well as a sister, Miss Rebecca Dodd, of Brookline."

G. V. Wendell recently made a short trip to Boston and called on your secretary and wished to be remembered to the various members of the class. Wendell is looking forward to sabbatical year which is to start next February.—W. Spencer Hutchinson has been making various excursions examining mining properties and expects soon to make a trip to Australia.

1895.

WINTHROP D. PARKER, *Sec.*, 12 Bosworth Street, Boston, Mass.

The following article was taken from a recent number of the *Engineering Record*:

Louis K. Rourke, of Rourke & Sherman, consulting engineers of Boston, has been retained by the Braden Copper Co. to investigate and report on its railroad at Braden, Chili. Mr. Rourke sailed from New York on September 9, and expects to be gone for about five months.

Mr. Rourke graduated from the Institute, class of 1895, and his first engineering work was for the Boston & Maine Railroad, whose employ he left in 1897, and became supervisor of track for the Panama Railroad. During the next five years, he was engaged on railroad work in Ecuador, following which he spent about two years in Mexico. In 1903 he was made superintendent of construction of the Guayaquil & Quito Railroad, but returned to Massachusetts the following year, to engage in highway construction contracting. Again he went to Panama in 1905, to join the Isthmian Canal Commission, returning to the United States in 1910, to become superintendent of streets of Boston. Subsequently he became commissioner of public works, and held the position until last year, when he resigned to join Edward C. Sherman, M. I. T. '98, in the consulting firm of Rourke & Sherman.

A rumor comes from New York to the effect that Huxley has been considering another trip to England and France, in the hope that as he was not successful in making a "go" of it before, he might do better this time. From latest report, however, it seems he has been prevailed upon to abandon this latest attempt to stir up international complications.—Ray Willis, who was adopted by '95 in June, was seen at the Technology Club in New York, October 27, and reported in an interview in answer to the question, "Are we downhearted?" "No!" and in answer to "How is every little thing?" "Fine!"

After leaving the Reunion, Walter Marmon had the misfortune to meet with an automobile accident, in which his father-in-law was fatally injured. Marmon sustained a serious fracture himself, but has completely recovered, after being confined in a hospital for some weeks, and has now returned home.—E. L.

Wengren of Portland, Me., reports much M. I. T. activity in that city. Fifty or sixty men have been located in the city proper, and nearly one hundred in the State, and meetings have been planned to be held during the winter. This is a result of a "get-together" dinner held last winter at the Falmouth House in Portland.—A letter from George E. Howe, Wauseon, Ohio, mentions a most enjoyable vacation, after the Reunion, spent at The Birches on Student Island, in the Rangely Lakes district, Me. He writes with enthusiasm of this place as being an ideal one for a person desiring a good loaf.

1896.

CHARLES E. LOCKE, *Sec.*, Mass. Inst. of Tech., Cambridge, Mass.
J. ARNOLD ROCKWELL, *Asst. Sec.*, 24 Garden Street, Cambridge,
Mass.

An explanation is in order from the secretary for the tardy report of the Reunion doings.

Ike Litchfield announced early last June that the July issue of the REVIEW would go to press too early to allow for any extended reports of reunions. Later events proved that Ike was a liar, but at the time the secretary had not enrolled him in the Ananias Club and accepted his statement as gospel truth. As soon as the Reunion was over, Ike came out with a tale that he hadn't enough matter to make a magazine of decent size and would consequently delay publication of the July issue until the class secretaries could send in some manuscript. This developed into a boomerang for Ike and he received such a flood of matter that he was out of sight both literally and figuratively during the summer, and only came to view again in September. The final result was the voluminous two-part issue for July which appeared as a Thanksgiving number. It is hoped that Ike has learned his lesson and will realize that it is not good policy to delay publication to such an extent again. In the writer's opinion, the big July number was not due entirely to the fact that Ike delayed it so long, but partly to the fact that Ike moved his office to Cambridge in September, and incidentally transferred his roll top desk. Now those who have seen his desk know what that meant, but for those who have not, it is sufficient to say that it is piled so full that the roll top bulges out when pulled down, and when Ike wants to do any work he has to go into the next room to get a clear space. Ike's idea was to move the desk *in toto*, but the movers balked and declared that they were not safe movers. So Ike had to clean it out, and in the process he came upon masses of buried matter which, although ancient, seemed to him to be perfectly good, and thus the thrifty soul shoved it into the REVIEW.

But the writer has digressed. The Reunion week kept him on the move and immediately after the Reunion he had to start for

the Lake Superior region with the mining summer school. This was followed almost immediately by a trip to Florida, and later by a trip to Canada, so that it was impossible to find time to write up the Reunion.

Howbeit the lapse of time since June is not without its advantage in giving us a chance to look back on the event from a better viewpoint, and to appreciate what a good time we had and how large a number of the fellows we met, many of whom had not been seen since 1896. This is the biggest gathering '96 has had in twenty years, and may be perhaps the biggest crowd we will ever get together, although it is hoped that our twenty-fifth, five years hence, will surpass even this. The figures of registration given later tell the story.

To start at the beginning, last winter had been devoted to preparations. Class meetings had been held, committees had been at work and frequent announcements printed and mailed to every member. A year in advance, John Rockwell had secured the option on the Hartford Yacht Clubhouse on Fenwick Point near Saybrook, Conn. Everything was moving along satisfactorily when late in May the announcement came that the Yacht club had decided not to open the clubhouse this year. This looked serious, but through the good offices of George W. Baker (M. I. T. '92) of Hartford we were given permission to use the clubhouse free, provided we would assume the expense of opening it up, and of later putting it back in the condition in which we found it. To Mr. Baker for his kind help in this and in many other details, to U. S. Senator Morgan G. Bulkeley of Hartford and Fenwick, for his kind permission to use the Fenwick golf course and tennis courts, and to the officers and members of the Yacht club for the use of the clubhouse, the class owes a great debt of gratitude, and has formally expressed its appreciation for the many favors received, without which the reunion could not have been the success that it was.

The next problem was a man to take charge, and here, at the suggestion of Mr. Baker, we got in touch with Horatio G. Chapman, the proprietor of Ye Old Saybrook Inn. There we found a man made for the job. He immediately took charge of everything and threw himself into the spirit of the thing, seeming to understand intuitively just what we would need. Those who attended saw how smoothly everything went off, how good the food was, and how every attention was given us by Chapman and his efficient corps of assistants—Dan, Bill, Nelson and the chef—should understand how the credit is all due to Chapman. He had even selected the musicians and made a tentative agreement with them before the subject of music was even raised with him. He likewise made the transportation arrangements with Thomas Coulter to transfer men and baggage three miles from Saybrook Junction to the clubhouse. Here again, Chapman's



On piazza (left to right)—Moat, Guptill, Hurd, Fred Fuller, Stearns, Fisk, Gilman, Harkness, Allen, Anderson, Rockwell, R. A. Davis, Hatch, Stoughton, Leighton, Jim Driscoll, G. C. Hall.

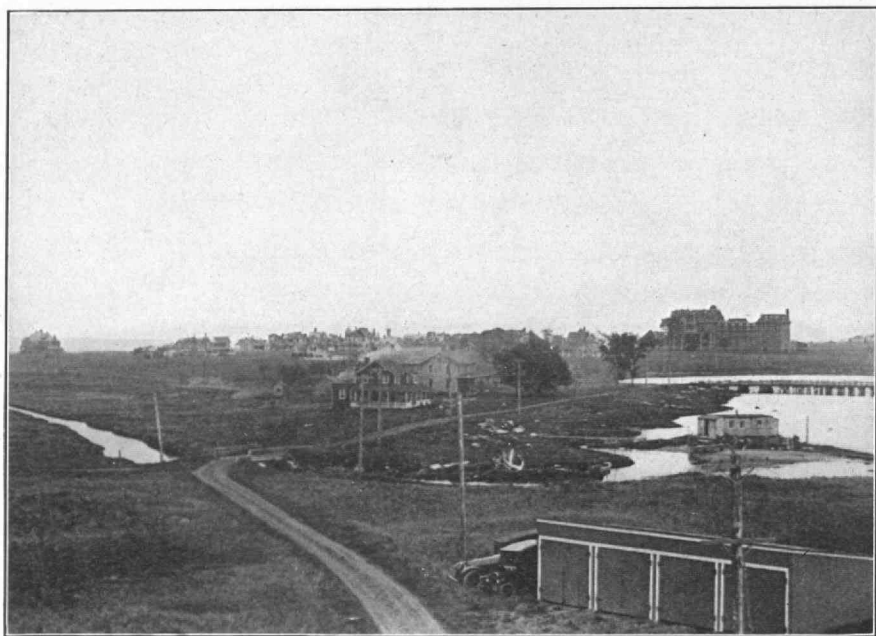
On ground (left to right)—Locke, Smetters, Wayne, Melliush, Hersey, Hallaran, Buster Crosby, Harry Baldwin, Hultman, Tyler, Lawrence, Dickinson, Pierce, Dove, Joe Driscoll, Hunt, Thompson, Brackett, Grush, Bragg, Woodwell, Wise, Barker.



On piazza (left to right)—Leighton, Bragg, Locke, Wise, Hurd, Hultman, Moat, Barker, Harkness, Pierce, Stoughton, Smetters, Lawrence, Fisk.

On ground, standing (left to right)—Waiter, Thompson, Guptill, Merryweather, Gilman, Stearns, Fred Fuller, Tyler, Melliush, G. C. Hall, Woodwell, Joe Driscoll, "Dan," H. C. Chapman.

On ground, sitting (left to right)—Hallaran, R. A. Davis, Jim Driscoll, Hersey, Allen, Rockwell, Anderson, "Bill," Dickinson, Hatch, Hunt, Wayne, Crosby, Baldwin, Brackett, Grush.



Looking Inland from Club House with Golf Course in the Distance



Club House from the Land Side

CLASS OF '96—TWENTIETH ANNIVERSARY



Feed Time at Hartford Yacht Club

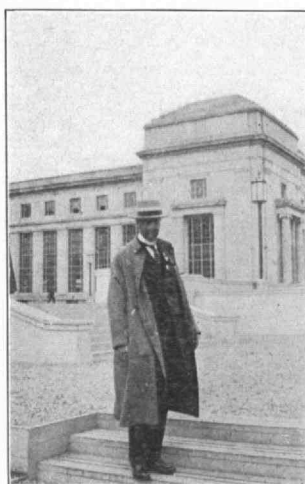
Rear, standing—Three waiters.

Rear table (left to right)—Wayne, Brackett, Hunt, Crosby, Dickinson, Stearns (?), Wise, Locke, Hatch, Smetters, Pierce, G. C. Hall, Melliush, Lawrence, Barker, Leighton, Woodwell, Grush (?), R. A. Davis.

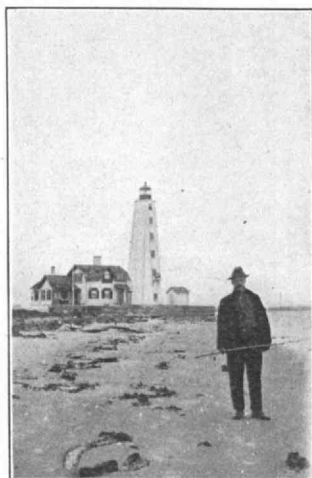
Standing and at front table—Rockwell, Dove, Gilman, Tyler, Hallaran, Jim Driscoll, Merryweather, Thompson, Guptill, Stoughton, Anderson, Allen, Joe Driscoll, Fred Fuller, Hultman, Harkness, Moat, Fiske, Hurd.



Outer Light—Where Rockwell caught his Fish



Johnny Rockwell all dressed up



Inner Light—Harry Isaac Walton Baldwin

CLASS OF '96—TWENTIETH ANNIVERSARY



Club House



View looking out to Sea showing Jetties and Inner and Outer Lights
CLASS OF '96, TWENTIETH ANNIVERSARY

judgment was fine. Tommy gave a good ride and full value for the money and was on the job at every train so that no one had to wait for him, although to do so he stayed up one or two nights a little beyond his usual retiring hour. Tommy gave indication of some latent elements in his make up (especially after dark) which, if they had been properly cultivated in his earlier years, would have developed him into a characteristic '96 man. If the reunion could have been prolonged a week or two these latent possibilities would undoubtedly have manifested themselves more strongly. It seems too bad that Tommy could not have had a course at Tech to develop them fully.

The secretaries each made a trip to Connecticut just previous to the opening to see that everything was all right, but these might as well have been omitted since Chapman did everything so well. All possible preparations were thus apparently made in good season. It later transpired, however, that no one had thought to arrange with the weather man. To this oversight was due the lack of bright warm days which we had expected. We had, however, only one-half day of rain with the rest of the time partly cloudy and partly clear, and all the time cool. The wood fire in the fireplace made it cosy inside at all times. The cool weather did not encourage bathing and Sam Hunt was the only man who tried the water. He has had a life-long habit of taking a cold bath every Sunday morning and he felt that he could not omit it even at Fenwick Point. At the clubhouse we were better off than we would have been in Boston, where it rained almost every day for the four days.

On the opening day, Thursday, June 8, Samuel Smetters was the first arrival, getting in at 10.30 a. m., from Chicago, and therefore becoming official recorder for the reunion. At 3.40 p. m., Hurd, Merryweather and Wayne got in on the train from New York; then at 4.24 on the train from Boston came Pierce, Locke, Anderson and Moat, and at 5.45 Tyler came in his auto bringing Joe Driscoll and R. A. Davis. They reported that Bert Thompson had left Boston in his car at the same time bringing Jim Driscoll, Barker and Rockwell, but that Thompson had probably got lost in Roxbury. Later, when Thompson got in at 6.30 he said his machine balked in front of a brewery and they spent an age trying to start it again, and finally had to blindfold it and lead it past. Guptill came alone in his car at 7 o'clock and Grush, Fred Fuller, Harry Fisk and Jim Melliush by train at 7.15. The last arrival that night was Mark Allen from Detroit at 7.30. This made a total of twenty-one men the first evening. The band had arrived promptly at 6 o'clock and immediately got busy with music just suited to the occasion. This was a glorious social evening when the men got together and talked over old times, played cards and sang and it was 1 a. m. when the last man turned in.

Friday was cloudy and cool, but without rain. Hurd, Rockwell, Merryweather, Pierce, Anderson and Smetters went fishing in the forenoon at the outer light on the end of the jetty. Rockwell caught two blackfish and one big one that got away; Merryweather caught a cunner; the rest caught nothing. Some of the fellows tried the tennis court and golf course. Some went off on exploring expeditions. After lunch the official cruise was held, but the weather was cool and only eight men started and they were satisfied to return to the warm clubhouse after a very short time.

At 11.30 a. m. Dickinson had come in by train from Providence; at 3.35 p. m., Lawrence and G. C. Hall came in auto from New York, and at 4 o'clock Hersey and Doc Gilman by auto from Boston. The train at 4.55 brought Buster Crosby, Bragg and Hultman. Great noise and excitement outside at 7 p. m., accompanied the arrival of Johnny Dove in his Fordometer—all the way from Butternut farm. Johnny was about all in, but after being carried into the clubhouse and given Dan's first aid treatment he quickly picked up, and from that time on was little "bright eyes" of the party. Harry Baldwin, Walter Stearns and Sammy Wise got in at 7.30, and George Harkness and Johnny Hallaran at 8, thus bringing the total number up to thirty-five. By this time the fellows had begun to get acquainted with one another and threw off some of their reserve. Some talked, some sang, some played cards and some tried to go to bed early. Harry Fisk showed the band how to make music; Harry Gilman executed a few steps; Bill, the waiter, kept fairly busy, and even Chapman himself managed to keep awake and forgot to go home early to his wife and family, altogether it was a fairly lively evening and some sat up as late as 1.30 a. m.

Saturday morning arrived, to some, very soon after Friday evening. This day we had rain in the forenoon but it cleared off at noon. In spite of the rain Hurd and Rockwell tried their luck again at fishing and brought home six fine blackfish which the chef served in proper form. Leighton and Woodwell arrived from New York at 11.40 a. m. Sam Hunt, Hatch and Skip Brackett came at 12, Stoughton at 1 p. m.; Wentworth, Stevens and Hewins at 4.15; Hellman by auto from Cleveland at 4.50, and finally at 5, Haste, Mansfield, Laws, Jacobs, Emerson and Bates. Total registration thus reached fifty-one men. Fisk and Fuller were obliged to leave this afternoon, thus reducing the number to forty-nine for dinner. Late in the evening Dickinson took the train for Providence cutting the number to forty-eight.

Group pictures were taken this day after lunch. Unfortunately the ten last arrivals did not get there in time for the pictures so that only forty-one men will be found in the pictures. A lot of men played golf in the afternoon and some went off automobiling.

Saturday evening the class dinner was held at which forty-nine

men sat down and for which Chapman had made special preparations. During the dinner greetings were read from Arthur Baldwin, Charlie Hyde, Partridge and others. Walter Stearns spoke of the wonderful work that Dr. Coolidge had been doing in the General Electric Research Laboratory. The tungsten lamp and new X-ray apparatus are almost entirely the result of Coolidge's work. Coolidge had hoped to be present and give a talk in person, but was unable to get away. The serious illness of Harry Brown was reported and the secretary was instructed to send greetings and sympathy. Illness of several '96 men or members of their families, or deaths of near relatives, served to keep away several men who would otherwise have come. This was the case with the Hedge boys, Stanley Howland, MacLachlan, Clark Holbrook, E. H. Robinson, Tozier and Con Young. Young had come to Boston a day before the reunion fully intending to come to Saybrook, but had been seized with an attack of tonsilitis which kept him confined to his room until Monday. Announcement was made that Laws had come the longest distance—from Salida, Colo. Barker, Leighton and Stearns represented the old '96 quartet and gave some of the old songs. Dr. Frank Schubmehl, who was our host at Squam Lake five years ago, and who is now with the General Electric Company at Lynn, sent greetings and regrets that he was unable to accept the invitation that had been sent him to join us at Saybrook. George W. Baker sent a similar letter.

After the dinner an informal class meeting was held and it was voted that the secretary buy and present a class cup to the first child born to a '96 graduate who was married after graduation. A collection of \$36 was taken up for this purpose. An original poem to the secretary was read by E. C. Hultman. It was a gem. A roll call was made and each man present gave his name and address and a brief statement of his work. Horatio C. Chapman was duly elected an honorary member of the class of '96. The Alumni Fund matter was discussed at length, and it was the sense of the meeting that every member of '96 could and should give at least one dollar so as to help the standing of the class, and at the same time get their names on the list of contributors soon to be published. It may be said incidentally that during the reunions in Saybrook and Boston many men were seen personally and a small contribution secured from every man interviewed.

The meeting gradually drifted into story telling and various amusements. The band gave us special music, playing many pieces by request. This was their last night with us and they certainly laid themselves out to please. It was a treat to the class to have a trio of musicians enter into the spirit of the reunion as they did, and each became practically one of us in the celebration of our twentieth anniversary. They were determined to satisfy us and they did and more too. Every man present appreciated

their efforts and with possibly one exception felt that they had done everything they could. Johnny Dove, however, still found his craving for music unsatisfied and at 2 a. m. Sunday morning, when about everyone had retired, insisted that the band loan their instruments to his impromptu band which, under his leadership, made a round of the house from top to bottom. Johnny himself played the horn (Ford, not French), and after the march was completed declared himself as believing that everyone had had his fill of music and everyone agreed with him as far as his brand of music was concerned. Finally, every man found a bed although the sleeping capacity of the house about reached its limit this night.

Sunday, June 12, showed up cloudy and after breakfast the men began to go, and departures continued during the day, about half having left by lunch time. Some went by auto to Boston and New York and some by train. Altogether there were nine men who were at Saybrook who did not get to the Boston celebration. By 4 p. m. only six men were left. The original program had been that Lawrence and Locke would stay over night to fire the rockets to salute the steamer *Bunker Hill* carrying the Tech bunch from New York to Boston, but by the middle of the afternoon the fog was so thick on the water that it was decided that it would be futile to try to make an exchange of rockets in the evening, so the leftovers packed up and went up to Saybrook and had supper at Chapman's Inn and then caught the train for Boston in the evening.

Thus ended our twentieth anniversary. It is believed that everyone who attended enjoyed the outing thoroughly and will be on hand at our next which will come five years hence. The clubhouse was an ideal spot for the affair and an option on it has been obtained for 1921, provided it is still in existence.

The class is greatly indebted to Jim Haste, who kindly offered to develop and print any plates or films that the Saybrook crowd might send him. From all the films submitted he selected ten of the best and printed fifty-one sets, one for each man present at Saybrook. These have been mailed by the secretary and every Saybrook man should have received a set.

The Boston events for Monday, Tuesday and Wednesday have already been detailed in the REVIEW. The successful tea in the new buildings on Monday afternoon to all the great throng of visitors was under the direct charge of Joe Knight. The informal meeting for dinner Monday night at Marston's restaurant on Han-over street proved to be a happy choice, and in the opinion of many was a much better way to meet than a formal course dinner and the location was in close proximity to the City Club so that the crowd marched in a bunch to the smoker. Tuesday at Nantasket was a perfect day. We were favored with the company of Mrs. Helen Chamberlain Dodd who marched with us in the front row. The class stunt went off smoothly. The scenario of it was

in two parts representing the changed relations between Tech and Harvard during the past twenty years. The stunt opened with a Technology background and two scrappers, Wayne and Billy Anderson, the former with Harvard colors, and the latter with Tech. Several times Harvard nearly put Tech down and out, but every time Tech came up smiling and finally landed a knock-out to Harvard. In the short conference which followed, it was decided that fighting and competition would no longer exist but that Tech and Harvard would henceforth coöperate. Meanwhile the scene had changed and the Tech and Harvard mottoes were seen entwined and the Tech and Harvard men marched off arm and arm to the tune of Fair Harvard.

The class marched in a body to its seats at the dedication on Wednesday afternoon and had the pleasure of being accompanied by seven of its lady members. At the final event, the grand banquet at Symphony Hall, Wednesday evening, Walter Stearns did a little private interviewing and finally announced to the secretary that he had secured pledges to the guarantee fund of \$500 toward the expenses of our next reunion. It is not too early to begin to think about it, for five years slip by very rapidly and every member ought to make a mental decision now that he will be on hand.

One pleasant feature of the Reunion in Boston was the presence of T. I. Jones and his bride. They were married on Wednesday, June 7, and included the Tech celebration as a part of their honeymoon.

The official '96 registration in Boston was 123 and, with the nine men who came only to Saybrook, made a total of 132 names on Smetters' list as given below. At the various events the attendance was fifty-one at Saybrook, about fifty at Marston's for dinner Monday evening, about seventy-five at the City Club smoker that same evening, about eighty-five marching in the Nantasket parade, about fifty at the dedication Wednesday afternoon and about the same number at the banquet that evening.

	Course	Age	Married Single	Boys	Girls
Addison, Mrs. Julia De Wolf..	—	—	M	—	—
Allen, Mark W.....	I, VIII	43	M	1	1
Anderson, W. P.....	III	41	M	1	0
Ashton, George F.....	II	—	M	—	—
Bakenhus, R. E.....	I	42	M	0	1
Baldwin, H. S.....	II	41	M	0	0
Barker, E. H.....	II	45	M	0	1
Bartlett, F. W.....	XIII	—	M	—	—
Batchelder, Chas. E.....	VI	—	M	—	—
Bates, D. M.....	X	40	M	1	2
Beaman, D. W.....	VI	43	M	1	0
Bell, S. S.....	VI	—	M	—	—
Brackett, E. R.....	V	41	M	0	1

	Course	Age	Married Single	Boys	Girls
Bragg, E. M.	XIII	42	M	0	1
Brooks, J. F.	II	—	M	—	—
Chenery, W. H.	IV	—	S	—	—
Conant, F. M.	X	41	S	—	—
Crosby, R. W.	XIII	40	M	2	2*
Cummings, Henry	IV	41	M	1	0
Damon, F. W.	VI	42	S	—	—
Daniels, N. H.	VI	40	M	0	0
Davis, R. A.	VI	43	M	1	1
Deming, W. E. S.	VI	44	M	2	0
Dickinson, L. P.	VI	42	M	0	1
Dodd, Mrs. Helen C.	IV	40	M	2	1
Dorrance, W. T.	I	42	M	4	0
Dove, John	IV	44	M	1	0
Driscoll, J. M.	I	42	M	0	3
Driscoll, Joseph	I	42	M	0	0
Eaton, James	Mech. Arts	65	M	1	0
Emerson, L. E.	VI	42	M	2	2
Eynon, J. S.	VI	44	M	0	0
Fisher, Miss E. F.	XII	—	S	—	—
Fisk, H. G.	IX	43	M	2	1
Fitts, Miss Ada M.	VII	—	S	—	—
Fuller, F. W.	VI	44	M	0	1
Fuller, R. L.	IV	—	M	—	—
Gates, Miss H. L.	VII	—	S	—	—
Gibson, Charles	IV	—	—	—	—
Gilman, H. S.	IX	43	M	0	1
Goodhue, L. H.	V	—	M	—	—
Grabau, A. W.	XII	46	M	0	1
Grush, H. G.	VI	40	M	1	0
Guptill, F. E.	VI	42	S	—	—
Hall, G. C.	VI	45	S	—	—
Hallaran, J. S.	I	42	M	0	0
Hapgood, C. W.	V	41	S	—	—
Harkness, Geo. E.	I	44	M	0	0
Harrington, Jos.	II	43	M	2	0
Hartwell, H. B.	II	—	M	—	—
Haste, J. H.	V	47	M	0	0
Hatch, Geo. P.	II	42	M	0	0
Hayward, H. W.	X	—	M	—	—
Heerman, F. M.	II	—	—	—	—
Hellman, M.	VI	41	M	2	1
Henry, Ralph C.	IV	—	M	—	—
Hersey, F. C., Jr.	V	42	M	$\frac{1}{2}$ †	0
Hewett, Joseph	VIII	42	M	0	0
Hewins, G. S.	I	41	M	0	2
Hilliard, H. J.	V	—	—	—	—
Huey, W. Q.	II	—	M	—	—
Hultman, E. C.	I	40	M	0	0
Hunt, S. P.	V	43	M	0	0
Hurd, B.	VI	43	M	0	3
Ingalls, C. H.	VI	43	M	3	2
Jacobs, E. C.	III	43	Widower	0	0
James, W. H.	II	43	M	1	1
Jameson, M. S.	I	42	M	1	1

* Twins.

	Course	Age	Married Single	Boys	Girls
Jones, H. K.	IV	42	M	1	0
Jones, Theo. I.	VI	41	M	0	0
Kite, Miss Rebecca	VII	—	S	—	—
Knight, Jos. H.	IX	44	M	2	2
Lawrence, Chas. E.	VI	44	M	1	1
Laws, E. H.	VI	42	M	0	0
Leighton, M. O.	VII	42	M	0	1
Litchfield, P. W.	X	40	M	0	2
Locke, Chas. E.	III	41	M	0	$\frac{1}{2}$ *
Lythgoe, H. C.	V	42	M	1	0
MacLachlan, A. D.	VIII	40	M	4	0
Mansfield, E. S.	VI	45	M	1	1
Melluish, J. G.	IX	46	M	1	0
Merrell, I. S.	II	40	M	1	2
Merryweather, G. E.	II	44	M	1	2
Moat, C. P.	V	42	M	0	0
Moore, M. E.	II	44	M	2	1
Nevin, Chas. K. B.	IV	—	M	—	—
Norris, Miss Grace A.	VII	—	S	—	—
Palmer, J. Porter	VI	—	—	—	—
Partridge, W. M.	VI	44	M	0	1
Pauly, K. A.	VI	43	M	0	0
Peckham, H. A.	IV	—	—	—	—
Pierce, M. E.	I	42	M	0	0
Pingree, E. D.	II	53	Widower	1	0
Priest, M. C.	II	42	M	1	0
Richardson, D. A.	II	42	M	1	2
Rockwell, J. A.	VII	43	M	0	0
Root, Wm. L.	X	40	M	1	0
Russell, A. LeBaron.	IX	—	—	—	—
Rutherford, N. F.	VI	—	M	—	—
Sanderson, N. H.	I	45	M	1	2
Savage, A. D.	—	—	—	—	—
Sherman, H. A.	III	42	M	0	1
Sjostrom, H. W. L.	VI	—	M	—	—
Smetters, S. T.	I	44	S	—	—
Smith, Howard E.	XI	41	M	0	1
Smith, Herbert E.	IV	—	—	—	—
Smyser, J. S.	II	44	S	—	—
Spahr, A. H.	IV	43	M	0	2
Stamp, C. E.	III	43	M	0	1
Stearns, W. M.	VI	42	M	0	0
Stevens, Harold C.	I	42	S	—	—
Stone, Miss Esther.	IV	—	S	—	—
Stoughton, B.	III	42	M	2	0
Swan, Miss Almira F.,	VII, XII	—	S	—	—
Tappan, L. H.	II	—	M	—	—
Thompson, A. W.	II	42	M	0	1
Tilley, John.	VI	42	M	0	1
Torrey, Emily E.	VII, IX	—	S	—	—
Tower, C. B., Jr.	V, X	—	—	—	—
Tucker, C. W.	V	44	M	2	1
Tyler, L. S.	VI	42	M	1	1
Underhill, A. P.	VI	43	M	0	2
Walker, H. E.	VII	—	—	—	—

* Stepchild.

	Course	Age	Married Single	Boys	Girls
Wason, R. S.	V	—	—	—	—
Wayne, J. L.	VI	42	S	—	—
Wentworth, C. A.	I	41	M	1	2
Willis, J. H.	IV	45	M	0	0
Wise, S. F.	I	41	M	0	0
Wood, Miss Elvira.	XII	—	—	—	—
Woodwell, J. E.	II	42	M	2	0
Wright, Mrs. J. H.	IV	—	M	—	—
Young, C. H.	II	41	M	0	0

Smetters has summarized his figures and obtained the following interesting facts:

Listed members of '96:

Graduates	189
Non-graduates	285
Deceased	9

Total 483

Graduates attending reunion	92
Non-graduates attending reunion	40

132

Attendance of graduates by courses:

Course	Graduates Attendance	Total Living Graduates	Graduates Deceased
I	14	27	0
II	15	31	2
III	5	12	3
IV	10	24	2
V	9	15	1
VI	21	48	1
VII	3	3	0
VIII	1	3	0
IX	4	8	0
X	5	7	0
XI	1	4	0
XII	2	3	0
XIII	2	4	0
Total	92	189	9

To give an idea of the cost of the reunion, the following statement has been prepared. It will be noted that the class finances are rather low, and it will probably be necessary to levy an assessment very shortly.

STATEMENT OF RECEIPTS AND EXPENDITURES OF CLASS OF '96, COVERING PERIOD
FROM NOVEMBER 22, 1915, TO OCTOBER 1, 1916

Receipts

Cash on hand, November 22, 1915	\$ 65.21
Dues collected during period	133.10
Collected from men for refreshments at Saybrook	112.55
Collected from men for garage at Saybrook	12.00

Collected for meals and lodging at Saybrook at \$5 per day.....	\$507.80
Gift to class at Symphony banquet (surplus of collection for wine).....	13.00

\$843.66

Expenditures

Reunion preliminary expense, printing, postage, etc.....	\$ 49.36
Charges for refreshments at Saybrook.....	112.55
Charges for garage at Saybrook.....	12.00
Help, music and piano at Saybrook.....	68.00
H. C. Chapman, one half expense of opening clubhouse.....	25.00
H. C. Chapman, meals and lodging at Saybrook.....	425.00
Free refreshments at Saybrook.....	7.50
Bats and balls.....	2.50
Fireworks for salute at Saybrook.....	16.85
Bills for class stunt at Nantasket.....	70.78
New class banner.....	23.50

\$813.04

Balance on hand October 1, 1916.....	30.62
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\$843.66

There is also in the treasury \$36 representing the collection taken at Saybrook for the purpose of purchasing a class cup to be presented to the first child born to a '96 graduate after graduation.

Regarding the class cup the secretary begs to report that he has not made an award yet, but has preferred to wait until the class had been canvassed and the full evidence obtained regarding the respective claimants. At the present time the cup should apparently be awarded to Miss Martha Gage, the daughter of Steve Gage of Course V. She was born September 24, 1897. Marshall Leighton's daughter, Helen, was not born until October 9, 1897. Both Gage and Leighton were married soon after graduation. The conditions are that the cup shall go to the first child born to a graduate who was married after graduation. The secretary will be glad to receive information regarding any graduate who may have a child with prior claims to Gage.

While on the way to Duluth in June, the secretary took advantage of a short stop in Chicago and called on Johnny Putnam who was found to have developed into a prosperous bond seller, too busy to come on to Boston although he had sent his wife to New England for the summer. Johnny's shadow has not grown less in recent years and he is still in the John Manaham class.—The latest news from Harry W. Brown is that he is now able to be out and hopes to be back to work in the near future. His old enemy, rheumatism, kept him in bed from May to September, and this with rheumatic fever brought him very near to death's door. He has been sitting up for the past two or three weeks and has reached the point where he can walk out on the piazza. May his recovery continue and may he have a bumper cranberry crop from his Cape Cod bog!—Myron L. Fuller of the Associated Geological Engineers spent the months of March, April and May in oil in-

vestigations in the Osage Nation of Oklahoma and other sections of Oklahoma, Kansas and Missouri. In July, on the completion of the oil investigations, he sailed for Santiago to take up an investigation of the ground water supply for the large sugar plantations of the United Fruit Company on the north side of the island of Cuba.—Burgess has been rushing into print again with two papers, one published by U. S. Bureau of Standards on "Further Experiments on the Volatilization of Platinum," and one read before the Franklin Institute on "Some Problems in the Physical Metallurgy at the Bureau of Standards."

Thanisch writes from Cananea, Mexico, as follows:

During the early part of June I left here for Pachuca. I arrived at Mexico City the day after all Americans were obliged to leave Pachuca in a hurry. After the lapse of several days I finally decided to take a chance, especially so in view of the assurances of the company. As there were no Americans residing in Pachuca, I thought that in case of a necessity I might pass myself for a German. Upon becoming familiar with the office records I was able to understand the position of the acting management in repudiating the arrangements made by the former management. Even if there had not been an internal reason the condition of the country was such that I would not have remained.

Although I found no difficulty in getting into the interior, I found it somewhat different with regard to getting out. At this time all Americans had been notified by the U. S. Government to get out of the country. The ambassador had left Mexico City. It was not safe to make the trip by rail. I went to Vera Cruz and got aboard a U. S. A. transport (*Hancock*); I was one of more than one hundred refugees; landed in New Orleans and from there went to Phoenix. In reply to a letter to the Cananea Consolidated Copper Company I received a wire to come on at once. Am at my former job of engineer at the Puertecitos mines.

How long this company may be able to operate is an open question. The November election will probably have much influence on Mexican affairs in general. The country is in very bad shape; there is no one in sight who appears to have the qualifications necessary to restore normal conditions. One of these fine days we will probably all have to get out.

John Gurney Callan writes from the University of Wisconsin that he has been East all summer, but was absolutely unable to come in time for the Reunion and was as busy as a bird dog from the first day to the last so that his plans in this respect went astray. He reports the work there very interesting indeed. His title is professor of steam and gas engineering. He also has some sections in commercial engineering and quite a bit of committee work, among other things is chairman of mechanical engineering course. In addition he does a good bit of consulting work.—A. P. Underhill reports that he thinks the following address for Joe Franklin is correct: Fayette, Mo., state representative for Schramm and Schmieg Dry Goods Co., of Burlington, Iowa. Franklin has been among the missing for some time.—H. H. K. Sheridan has been located again. He is associated with the Studebaker Automobile Co. of Philadelphia and his address is Bellevue-Stratford Hotel, Philadelphia, Pa.

The secretary has no address for the following men and will welcome any clue to their present whereabouts: George L. Blakeslee,

Frank D. Clark, Walter M. Hollis, Carleton R. Hunt, Cecil H. Low, Malcolm H. McGann, C. B. Maynadier, Vance C. Osmont, Henry A. Pressey, Ellis W. Prince, Francis A. Rosengarten, Edwardo E. Saldana, William D. Smith, Joseph H. Smyth, Benjamin C. Williams.

1897.

JOHN A. COLLINS, JR., *Sec.*, 67 Thorndyke Street, Lawrence, Mass.

The Sagamore Reunion

(The "copy" of this portion of the story of the Reunion as written for the July REVIEW was lost in transit, and the loss discovered too late to obtain a second writing in time for publication.)

Sunday morning dawned, and with it came a temporary suspension of the hydraulic demonstrations which had been so much in evidence since our arrival at the Cape. As later developments showed, however, it was only to allow a mighty accumulation of moisture preparatory to a fitting send-off just at the time of our departure for Boston in the afternoon. Nevertheless, we were all thankful even for this slight truce and we made the best possible use of it.

Pugh and Carty were unusually early risers, and after a constitutional walk along the sands disappeared on some mysterious mission and although the real facts were never known, still the rest of us all had a feeling that day that the spiritual welfare of '97 had been well looked after by these two.

Breakfast over, plans were made to carry out the remainder of the sports program. The golfers again donned their oilskins and rubber boots, and with their mud-excavating tools in their hands rode off to complete the overturning of the turf on Cape Cod.

In strong contrast with these husky looking chaps appeared the tennis cracks, togged out in white flannels, silk shirts and all such society drapery.

Still others betook themselves to Manomet Pond where the boat races and swimming matches were held. Your scribe went with this party, and would like to tell of all he saw, but it is not permissible.

Several heats were necessary to decide the tub (I beg pardon, I mean the boat) races. Binley was sent out into the middle of the pond to act as a movable stake boat, and then trial heats of three boats each were run. Invariably the last man to get away won the race, as the other two in their excitement fouled each other, and while they were exchanging courtesies the third man sped around the stake boat and home. Although the pond was several miles long and one wide yet there was not room enough so that Worcester and Bradlee could keep from interlocking oars in a death struggle for the survival of the fittest. Buff relieved Binley at the turning point and the latter entered the trial heat. And right here let me

suggest to the head of the department of naval architecture that he institute a course in rowing. Binley, a graduate of that course, and a man who can design everything in the boat line from a mud scow to a battleship, was no sooner well started on his race than he caught a crab (or two crabs or whatever the technical term may be) and lost both oars. Helplessly he drifted until Buff returning from acting as outer mark rescued him from a watery grave. The final heat was rowed amid great excitement and was won in fine style by Bliss.

The swimming race was next in order and should have been seen to be appreciated. Just previous to the initial plunge several photos were taken. After these had passed the censor, however, it was found that everything had been deleted except the sky and the water, so what's the use. As both Worcester and Bradlee, besides others, were entered in this race, one can well imagine the disturbance on the normally placid surface of the lake as the start was made. A tidal wave swept over the surface and several boat houses were washed a few feet higher up on the shores. As usual, Worcester came out the winner with Bradlee as rear guard.

On the way home from the lake, a stop was made to see the finals at the tennis courts. Here were Currier, Jackson, Pugh, Ballou, Ilsley and others playing to a critical gallery, Jackson and Currier winning the doubles, and Jackson the singles.

Sunday dinner saw the ending for the most of the men of the three days' frolics. After the abundant offerings of Mine Host Souther had been accepted and stowed, that personification of wit and humor that some forty odd years ago was named Billy Sawtelle, proceeded to present the prizes. These consisted of thermos bottles and cocktail mixers, and with his customary flow of eloquence Billy kept the men in an uproar. The complete list of winners is as follows: Tennis doubles, Jackson, Currier; tennis singles, Jackson; bowling, Collins; swimming, Worcester; rowing, Bliss; golf, first, Lamb; golf, second, Ilsley; runner-up (tennis), Ballou.

After these prizes had been distributed a table was brought in bearing thereon a small plush case, said case containing a noble bronze medal. As a particular mark of esteem, and in view of his eminently deserving qualifications for the same, this beautiful medal was presented to Wilfred Bancroft. A close examination revealed in the terms of heraldry a Goat Rampant.

And with this dinner the Sagamore Reunion of 1916 passed into history. Too many thanks cannot be given to the Boston members of the Executive Committee for all the labor of preparation that was necessary for the successful carrying out of the program. Everything was perfect (except the weather) and great was the enjoyment thereat, thereto, therefrom, therein, and there now. That tells the whole story. Most of the men returned to Boston Sunday afternoon, several staying over until Monday morning.

Those who were present at the reunion were: Binley, Russell, Brainerd, Bliss, Motch, Pugh, Speare, Hopkins, Elson, Joseph Bancroft, Wilfred Bancroft, Lamb, Breed, Jackson, A. W., Sawtelles, Billy and Harry, Cowles, Worcester, Currier, Vinal, Atwood, Mulhall, Learned, Carty, Ballou, Noble, Moore, Howes, Hawkins, Eaton, Eames, Bradlee, Ilsley, Smith, H. W., Alden, Buff, Jennings, and Collins.

At the class dinner at the City Club on Monday night in addition to the above were: Herring, Estabrook, Watts, Royce, Smith, J. W., Stiles, Howland, Walther, Underwood, Mansfield, Hall, Busby, Lunt, Le Baron, Cassidy, Humphreys, Brown, W. D., Boyd, du Pont, Fuller, Olin, Blood, Cotter, Jackson, H. D., Franklin, Lawler, Burrill, Capen, Ewing, Allen, Edmands, Marshall, or a total of sixty men, the largest gathering of '97 since graduation.

1898.

A. A. BLANCHARD, *Sec.*, Mass. Inst. of Tech., Cambridge, Mass.

Ninety-eight did not get any class news in the big two-volume issue of the *REVIEW* dated July. Perhaps it is just as well, for the *REVIEW* might not have been able to stand three volumes for a single issue. Ninety-eight did its part, however, at the big Reunion in June. It turned out 65 strong at the class dinner at the City Club and 50 strong at the alumni banquet at Symphony Hall. And Ninety-eight certainly had some stunt. A picture of it is shown in the July number of the *REVIEW*, page 532. The stunt featured the discovery of Tech's mascot, the Beaver, by Lester Gardner. A gigantic plaster beaver, 30 feet long and 12 feet tall, was designed by Henry Richmond and built under his direction. At the appointed moment Lester strode into the center of the limelight appearing to be in a brown study. He let it be known that he wanted a mascot for the Institute. Immediately a roaring lion rushed upon the scene and crouched before the master. Lester looked at him and then sadly shook his head, for the lion would not do. In turn giraffe, black bear, donkey, peacock, hobby horse, Teddy bear, polar bear, and kangaroo trotted forth only to be rejected. Lester appeared dejected but suddenly his countenance brightened with a happy inspiration and he shouted, "I have it—a Beaver," and he clapped his hands and immediately from way down the beach an enormous creature approached with slow and stately tread (the writer knows for he was one of twenty sweating galley slaves inside that animal—the rest of this account he found out afterward for he could not see a blooming thing except braces and canvas and plaster) and stopped with a low obeisance before its master, who, beaming with satisfaction, accepted it for Tech's mascot. Immediately from the bowels of the monster broke forth a loud Tech yell followed by one for

ninety-eight, which was taken up and repeated by the assembled multitude.

Everett N. Curtis has moved his law office to New York City, 2 Rector street, where he will continue the general practice of law.—Edward C. Sherman has associated himself with Louis K. Rourke, '95, under the firm name of Rourke and Sherman, to conduct a general consulting engineering practice with offices at 6 Beacon street, Boston.—Dr. Horace R. Thayer of the Carnegie Institute of Tech continues to receive favorable notices of his recent text books "Elements of Structure" and "Structural Design."—Lester Gardner, under the firm name of The Gardner-Moffatt Company, publishes semi-monthly a journal entitled "Aviation."—Simon Fleischer has obtained a temporary leave of absence from the General Electric Company of Lynn to act as business manager of a moving picture film, featuring Francis X. Bushman and Beverly Bayne. His offices are at the Quality Studio, 645 W. 43rd street, New York.—Dr. Hollis Godfrey, president of Drexel Institute, has been appointed a senator of Phi Beta Kappa.

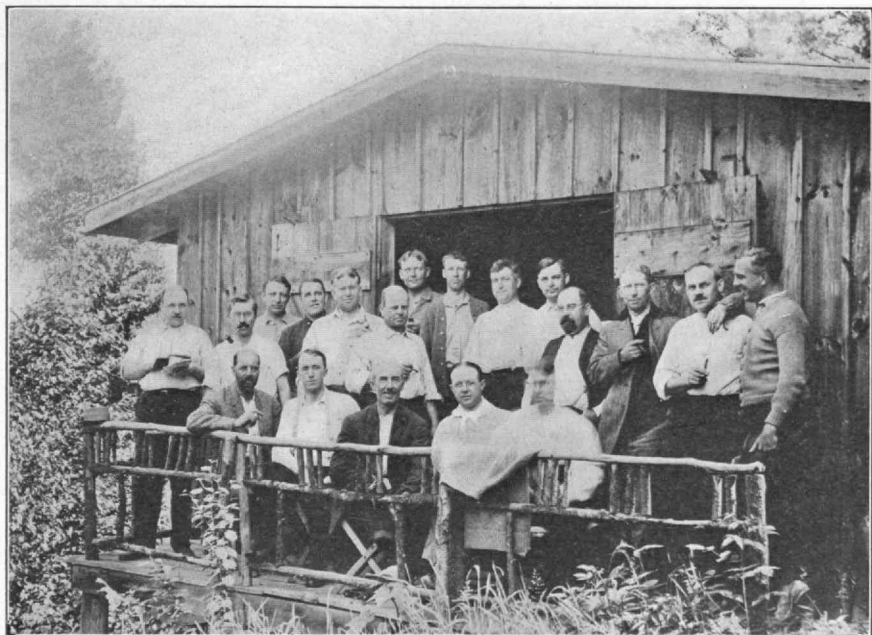
A. A. Packard has returned to the Institute as a member of the department of mechanical engineering where he will specialize in compressed air and refrigeration.—R. M. Hughes, now president of Miami University, dropped in the other day and reports that all is prospering at his institution. He also says that he has a fourteen-year old son and wants to send him to Tech.

1899.

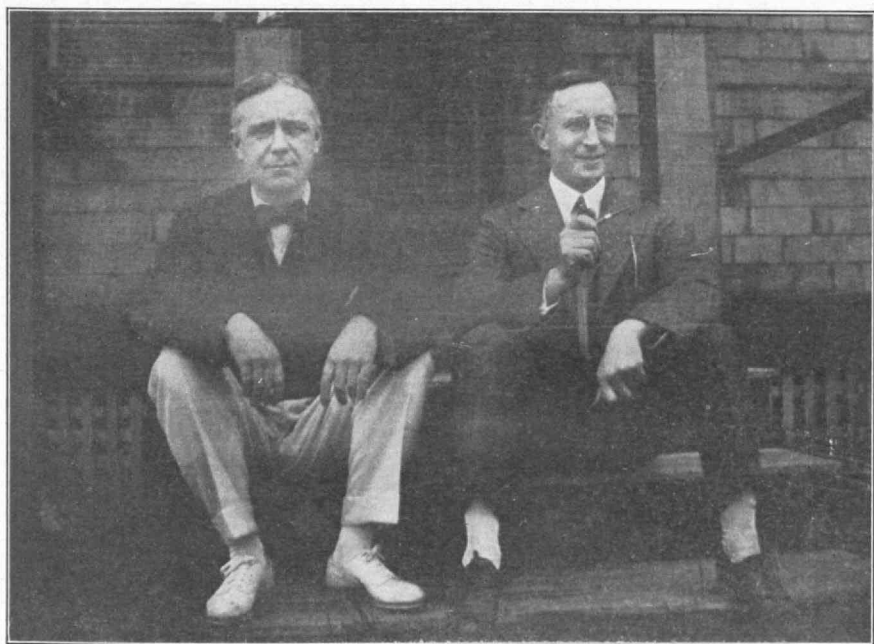
W. MALCOLM CORSE, *Sec.*, 106 Morris Avenue, Buffalo, N. Y.
BENJ. S. HINCKLEY, *Asst. Sec.*, North Station, Boston, Mass.

At a recent meeting of the Association of Class Secretaries, held in Boston, I. W. Litchfield, '85, read several reports and letters pertaining to the organization of the National Research Committee appointed for the Preparedness propaganda. Mr. Litchfield stated that the Technology members of the committee had come to him, requesting that the alumni become active in assisting this movement. A committee of three have been appointed by the Alumni Council, consisting of Frederic H. Fay, '93, G. D. W. Marcy, '05, and Benjamin Hinckley. It is especially urged that members of our class write to Mr. Hinckley, who, as you know, is our assistant class secretary, and offer suggestions as to how they can assist in this work.

Harry K. White, who has sent in the following items of interest, has changed his address to 50 Church street, one of the Hudson Terminal buildings.—A. Wallace McCrea, Course IV, with offices at 23 E. 15th street, has recently completed several new bank buildings for the Bank of Long Island, Long Island City. Perhaps the finest and most completely equipped turkish bath in New York



'99 AT SQUAM LAKE IN 1911



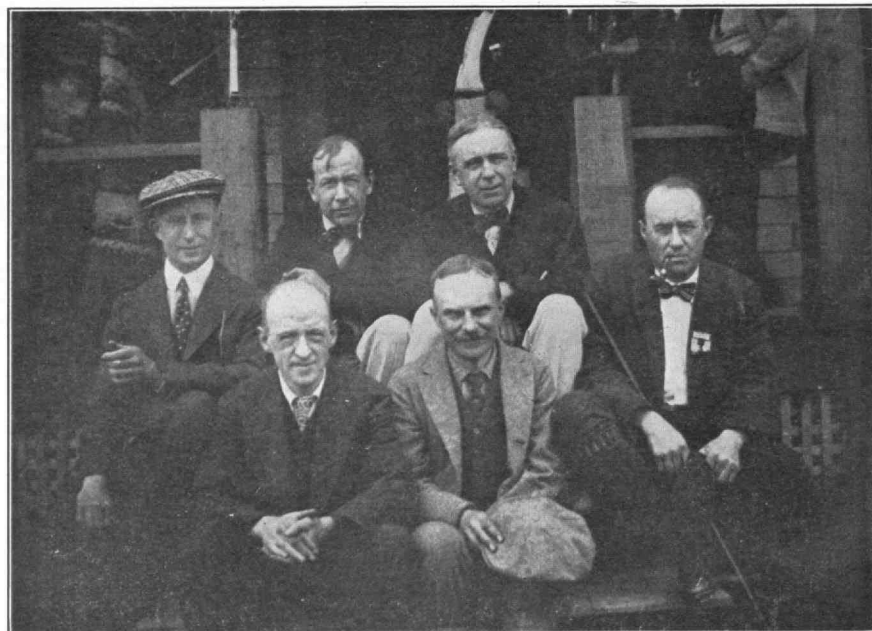
Hammond

Stone

CLASS OF '99—17TH REUNION, REXHAME, MASS.



The "Bunch"

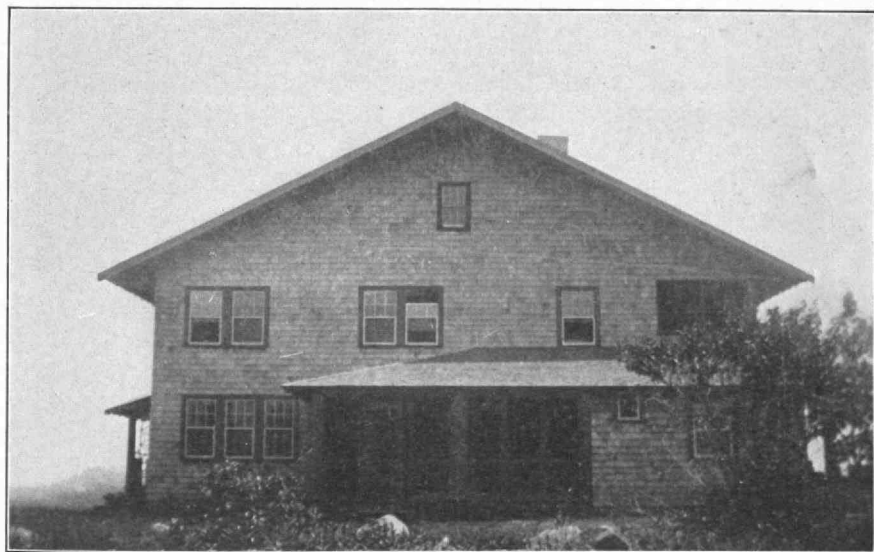


Stone, Kinsman, Hammond, Watrous,
W. O. Adams, Miles Richmond
1916

CLASS OF '99—17TH REUNION, REXHAME, MASS.

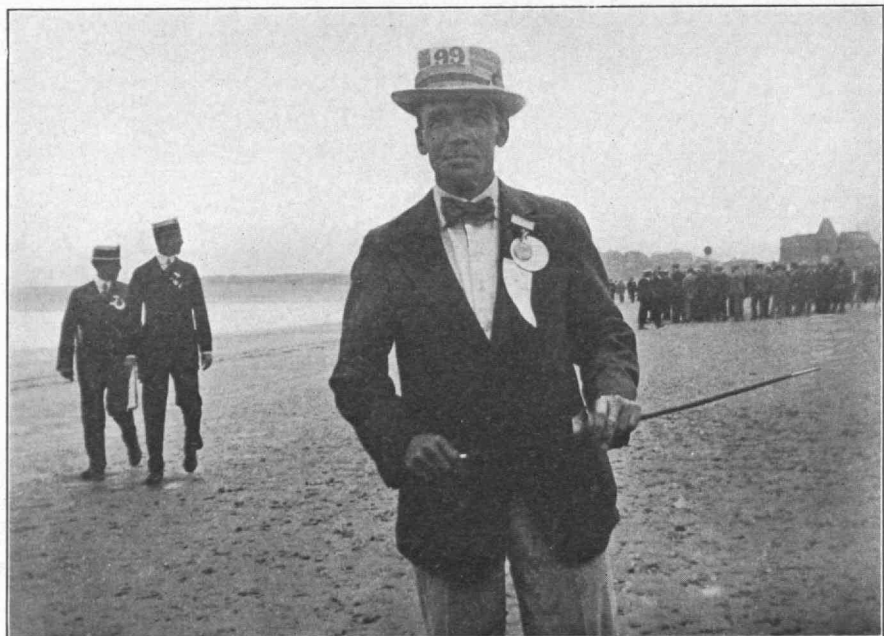


The "Cooks"

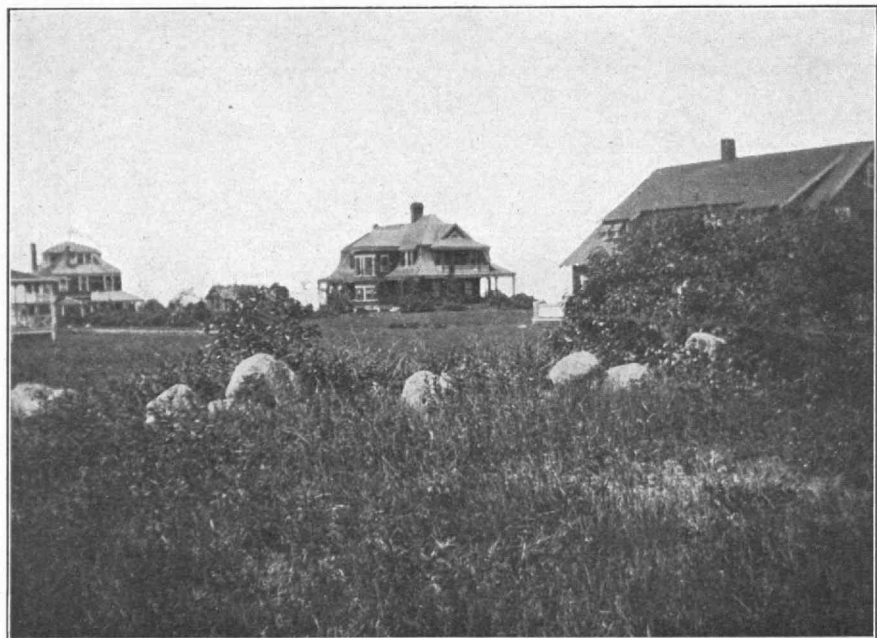


Ben Hinckley's Cottage Headquarters, Rexhame, 1916

CLASS OF '99—17TH REUNION, REXHAME, MASS.



Class Marshal Harry L. Morse

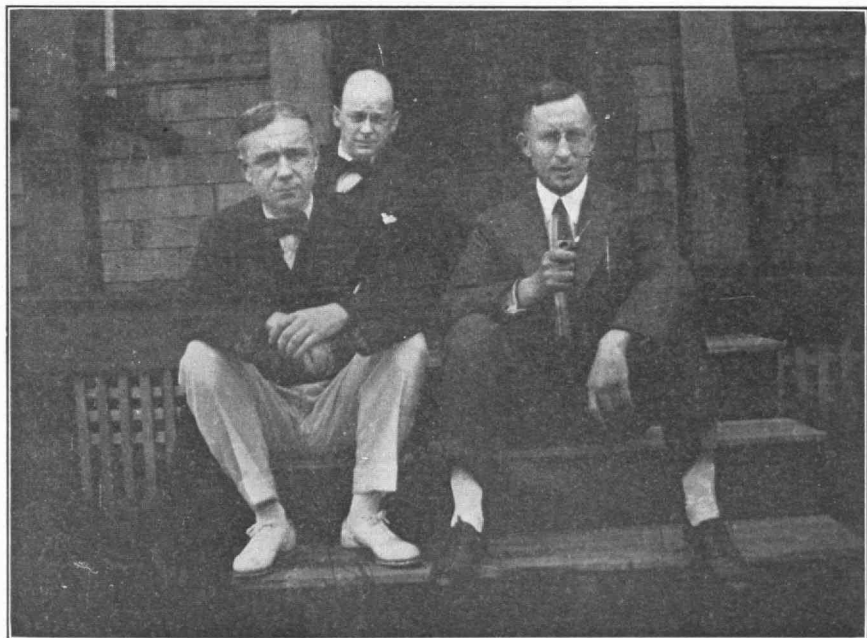


View at Rexhame, 1916

CLASS OF '99—17TH REUNION, REXHAME, MASS.



Kingman, Case, Kinsman
Rexhame, 1916



Hammond, Watkins, Stone
Rexhame, 1916

CLASS OF '99—17TH REUNION, REXHAME, MASS.

has also been constructed from plans prepared by him. This bath is located at the Hotel Ansonia.—J. Howard Adams, of Jackson, Robertson & Adams, architects, with offices in the Turks Head Building, Providence, R. I., is doing important work in eastern New England including many fine residences in Providence, and a \$200,000 Baptist church now nearing completion.—G. M. Gale, Course IV, is at present located in Baltimore where he has opened a studio. Gale specializes in architectural rendering of all sorts, and of late has gone into landscape work to a considerable extent.—Ira Betts, Course IV, is at present located in Philadelphia, being manager for the Atlantic Terra Cotta Company at its Philadelphia office.—Leonard H. Field, Jr., has for several years past been practicing architecture, in Jackson, Michigan. In and around Jackson, Field has some most interesting work to his credit. This includes a new Y. M. C. A. building, several large schools and a large number of important residences.—Jake Stone and Paul Jackson are practicing architecture under the firm name of Stone & Jackson with offices in Minneapolis and enjoy a large practice there today.—E. H. Hewitt is also located in Minneapolis and is a member of the firm of Hewitt & Brown.—E. H. Hammond at present is the owner and treasurer of the Hammond Process Company, manufacturers of high grade paints and varnishes. Offices and factory are located at Norwich, Connecticut.

W. C. Phalen submits the following interesting letter:

Last August, I resigned my position as geologist in the U. S. Geological Survey, to go to the Bureau of Mines as a mineral technologist. My headquarters are now at the bureau in Washington.

During September and early October, I traveled in western New York, Ohio, Michigan, Wisconsin, Missouri, Pennsylvania, and West Virginia, getting together information on salt industry of the United States. A portion of this work, relating to the geology and chemistry of the salt deposits of the country, is to be published by the U. S. Geological Survey. The part relating to salt-making processes, or the technology of the salt industry, is to appear as a bulletin of the Bureau of Mines. I have just returned from a trip to New York and Boston, where I went on a similar errand. While in Boston I had the pleasure of a brief visit with Professor Talbot. I tried to see Sherrill, but found him out.

I had the pleasant opportunity of being taken through the entire geological department of the new Institute and renewing my acquaintance with Professor Lindgren, the head of the department and a former colleague in the Federal Survey. I also saw Professors Shimer and Warren.

Recent publications are reports for the Geological Survey on the production and conditions in the following industries for 1915:

(1) The potash salts industry, which is attracting much interest at the present time. Our country always has been dependent on Germany for its supplies of this necessary commodity, and the European war has interfered with our imports, with consequently unheard-of prices for these salts, which are consumed in immense quantities in the fertilizer and chemical industries.

(2) The bauxite and aluminum industry.

(3) The phosphate rock industry.

(4) The sulphur pyrite and sulphuric acid industries.

(5) The salt bromine and calcium chloride industries.

I have also prepared and have had published in the *Manufacturers Record's* special issue of September 14, for the Chemical Exposition in New York, a paper on "Certain Minerals as the Basis of Chemical Industries in the South";

in *Mineral Resources of Tennessee*, a quarterly publication of the State Geological Survey, a paper on "Conservation of Phosphate Rock in Tennessee"; in the November bulletin of the *Transactions of the American Institute of Mining Engineers*, a paper on the "Conservation of Phosphate Rock in the United States." In the *Proceedings of the Second Pan-American Scientific Congress*, which will soon be published, I have also a paper on "Conservation of Phosphate Rock in the United States," which was prepared for the meeting held in Washington last winter.

I was appointed a member of the Committee on Water Power, Phosphates and Nitrates, of the recent National Conservation Congress, held in Washington this spring, and was appointed chairman of the subcommittee on phosphates and potash salts. I delivered papers on both these subjects before the Congress.

Many of the class will remember Gardner Hubbard and will be glad to read the following interesting account sent in by his father, telling of his services abroad:

My son, Gardner G. Hubbard, who was a short time with you, has been for the past two years in the allied service. The winter of 1914 and 1915 he was running an ambulance, and in the summer of 1915 he went to England and entered the Royal Flying Corps as lieutenant, and has been in the service ever since last winter, at the front, and since spring at different posts in England, as inspector, and testing new machines at the factories and flying them to the headquarters at Farnboro' near Aldershot. We have just heard from him at Oxford where he has been sent to instruct students in the rigging of aeroplanes.

As they are sending over a hundred new machines a week to the Continent there is a great field for instruction.

A. H. Herschel, whose address is care of Riggs National Bank, Washington, D. C., writes the secretary that he spent a very pleasant summer cruising in a small sail boat between Hyannis and Newport.

ALFRED WATERS PROCTOR

Alfred Waters Proctor was born in Needham, Mass., May 26, 1878, and died September 10, 1916, in Brooklyn, N. Y.

His parents moved to Boston, when he was three years of age, and he received his preparatory education in the public schools of that city. From an early age he showed an inclination toward things mechanical and always had a laboratory and workshop in his home. It was entirely natural, therefore, that he should select engineering for his life work, and he fitted himself for the profession at the Massachusetts Institute of Technology, becoming a member of the class of '99.

After leaving the Institute he was employed by a number of manufacturing companies, designing and superintending the construction and operation of machinery of various kinds. He owned and operated manufacturing shops in Washington, D. C., and Chicago, Ill., where he manufactured specialties of his own invention. He made many inventions during his career, some of which were of considerable value and importance. He was also variously employed as consulting engineer in the construction of machinery and in conducting tests.

For seven years Mr. Proctor was an examiner in the United States Patent Office, and during that time he attended and was graduated

from the Columbian University Law School. He was admitted to practice as a lawyer by the Court of Appeals of the District of Columbia and also by the Supreme Court of the United States.

Because of his peculiar qualifications, which now comprised a thorough training in the theory and practice of engineering, and a wide knowledge of patents and of patent law acquired in the Patent Office and in the Law School, upon leaving the Patent Office his services were sought as an expert in patent litigations. Somewhat reluctantly, perhaps, because he preferred the actual constructive work of the engineer, he took up the work of a patent expert and henceforth made it his principal life work, although frequently acting as consulting engineer. He was a hard worker, thoroughly conscientious, and possessed the power of concentration to a remarkable degree. With these attributes, of course his success was assured, and he was engaged in some of the most important patent cases before the courts in recent years. Not only was his standing very high with the members of the patent bar, but he also enjoyed the confidence and respect of the judiciary. Indeed, so highly was he esteemed by the judges, who were familiar with him and his work, that in several cases he was invited to sit with the court as technical adviser, a compliment as rare as it was well deserved.

He was a member of the American Society of Mechanical Engineers; the University Club, the Knickerbocker Field Club, and the Young Men's Republican Club, all of Brooklyn; and of the Technology Club of New York City. He died at his home in Brooklyn, N. Y., on September 10, 1916.

1900.

WILLIAM R. HURD, 2D.

RICHARD WASTCOAT.

PERCY R. ZIEGLER.

INGERSOLL BOWDITCH, *Sec.*, 111 Devonshire Street, Boston, Mass.

Not having received the July issue of the REVIEW which contains a very exhaustive class letter, the secretary was given a big jolt when he received a request for a letter for the next issue. It was too late to write to the class for news but, thanks to the REVIEW office and a few members of the class, the space reserved for 1900 will not be a total blank.

Ziegler has done some traveling this summer outside his regular dairy supply business. He spent a month in Nova Scotia and then took a two weeks' automobile trip with his wife around Quebec and Montreal, stopping at the smaller places he came to. Politically, he seems to think that Tech men who voted for Wilson four years ago will this year vote for Hughes. The truth of this statement will be seen before this letter is published.—George Gibbs was to have come East this summer and if he did he was very successful in keeping his arrival unknown to his friends. Bowditch

did what he could to get in touch with him but it was all in vain.—James W. Hussey, a designer for the Greenport Construction and Basin Company of Greenport, Long Island, has designed a speed boat which has been selected as a model for the navy mosquito fleet of volunteer speed boats. Rear Admiral John M. Helm, U. S. N., commanding the manoeuvres, said of Hussey's boat: "Standing out as a type which has demonstrated its usefulness is the 'Chingachgook,' a duplicate of the type used by the Russian navy. These boats have more than proved their usefulness."—Mr. Stanley Wood has announced the marriage of his daughter, Imogene Nixon, to Henry Curtis Norris, on August 29, 1916. They are at home at The Wyoming, Washington, D. C.—F. H. Tillinghast and W. Parker Ireland have formed the engineering firm of Tillinghast & Ireland, consulting and constructing engineers, with offices in the Forum Building, Sacramento, Cal., and the Nixon Building, Reno, Nev. They will practise irrigation, drainage, hydraulic and sanitary engineering. Tillinghast has been in the employ of the United States Reclamation Service for the past twelve years in charge of construction of irrigation works, the most recent of which is the Lahontan dam of the Truckee-Carson project in Nevada. Ireland was formerly in the water department of Chicago, later hydraulic engineer with Puget Sound extension of the Chicago, Milwaukee and St. Paul Railway, and until recently constructing engineer with the State Engineering Department of California.—Charles Van Merrick has been acting as advisory architect on the Albany County Court House, Albany, N. Y. He went to Albany in 1908 and represented the architects, Palmer and Hornbostel, throughout the construction of the State Educational building. At the completion of this building, he went into business for himself with W. P. R. Pember, under the firm name of Merrick & Pember.

The following address changes have been received: Bertram C. Hopeman, 569 Lyell Ave., Rochester, N. Y.—Willard W. Stone, Mount Pleasant, Iowa.

1901.

ROBERT L. WILLIAMS, *Sec.*, 70 Waban Hill Road, Chestnut Hill, Mass.

Last June we elected Matthew C. Brush president of our class. Recently the directors of the Boston Elevated also recognized his worth and elected him president of their company. The class congratulates Brush on his success.

Following is an extract from a full-page article in the *Boston Sunday Globe*:

Brush went to work for the Union Pacific Railroad in the humble capacity of apprentice in the shops, wearing overalls and jumper and receiving 20 cents an hour. Soon he was roundhouse foreman, and later general foreman of shops and roundhouses of the Rock Island system for western Kansas.

In 1904 he came East to be assistant to the president of the Boston Suburban Electric Company, which at that time consisted of nine electric railway companies, a gas company and two amusement places.

In eight months he had been made general manager of the properties and soon was elected vice-president. He put the concern on a paying basis.

In 1909 he resigned to become manager of the Buffalo Street Railway Company, which had 2,020 miles of trolley lines, 50 miles of steam road and 14 steamers plying on the Great Lakes. He had made too good an impression in New England to stay away from Boston, however, and was soon brought back to be assistant to the vice-president of the Boston Elevated, later becoming chairman of the efficiency committee, then second vice-president, then vice-president, and now, after but seven years' service with the "L," he is made a director and president.

Fifteen years ago he was wearing overalls and jumper and getting 20 cents an hour.

Today Matthew C. Brush wears a rose in the button-hole of his "pinched-back coat"—the rose taken from a basket sent him, among a dozen others, from friends who were glad that he has become President Brush. His predecessor in the office received a salary of \$36,000. It is not likely that his remuneration will be any less.

And some people say there is no more romance in business!

Mr. and Mrs. William L. Seabrook of Westminster, Md., have announced the engagement of their daughter, Miss Frances Guyon Seabrook, to Lieutenant Ralph Whitman, U. S. N., of Boston, who for three years has been stationed at Annapolis. The marriage will take place before Christmas. In 1905 Whitman visited the Isthmus of Panama in the personal service of the international board of advisory engineers convened to determine the type of canal to be adopted. Two years later he was commissioned an assistant civil engineer in the navy and last May was made a full civil engineer with the rank of lieutenant.—June 23 an eight-pound boy arrived at the home of William W. Dow, Waban, Mass.—Dr. and Mrs. Winfield Scott Matthew announce the marriage of their daughter, Hettie Belle, to Mr. Henry Charles Marcus on Tuesday, the eighth day of August, 1916.—W. W. De Berard is Western editor of *Engineering Record* and is located in Chicago.—W. Fred Davidson is with the Reliance Steel Casting Co., Pittsburgh.—Paul G. L. Hilken's name appears frequently in the newspapers of late as representative of the Eastern Forwarding Company, who are operating the German submarine *Deutschland*.

1902.

FREDERICK H. HUNTER, *Sec.*, Box 11, West Roxbury, Mass.
J. ALBERT ROBINSON, *Asst. Sec.*, Box 135, Canton, Mass.

The members of the class will learn with deep regret of the sudden death of Charles H. Boardman, Jr., on August 12, at his home in Lynn, Mass. Boardman had but recently recovered from a long illness and had been back at work only a few months at the time of his death. The Reunion in June was the first time for a long while that he had been able to attend class affairs.

The first year after his graduation Boardman spent with the

Carnegie Steel Co. in Pittsburgh and then returned to Boston, taking a position with Edward A. Tucker & Co., well-known structural engineers, and a few years later became a member of the firm. He was married in June, 1909, to Miss Edith Davis of Lynn and leaves a young son, Joseph Davis Boardman, born in June, 1914.

Boardman made his home in his native city where he was a member of the Oxford Club and other local organizations.

Rufus Whittet was married on September 30 to Miss Effie Osgood Byron of Roxbury. After a wedding trip they will reside at 15 Chilton road, West Roxbury, Mass., where they will be at home to their friends after November 1.—The engagement was recently announced of William DeF. Crowell to Miss Marion Bond, daughter of Judge H. W. Bond of St. Louis. We understand that the wedding will take place before this copy of the REVIEW has filtered through the press. Crowell took a special course in architecture and will be remembered by the Course IV men. He has been located in St. Louis for several years, being a partner in the firm of Mauran, Russell and Crowell, one of the largest architectural firms in St. Louis, J. L. Mauran, '89, the head of the firm, being president of the American Institute of Architects.—Not much news has come through to class headquarters since the last issue of the REVIEW so we have room to report the arrival at class headquarters, on July 13, of Elizabeth Sewall Hunter who has been appointed sporting editor of the *Retort*.

From a letter just received from Pendergast, written from Peking, we learn that McCarthy has a second daughter, now several months old, his first, Mary Elizabeth, having arrived in December, 1913.

Burton G. Philbrick and his wife are receiving congratulations on the birth of Burton Stiles Philbrick on September 8. The young man and his mother are both in the best of health.—“Bill” Williston has been transferred from the Boston office, Hancock Inspirator Company, to Manning, Maxwell & Moore, who are the selling agents for the company's manufacturers. He will hereafter make his business headquarters at the New York office of Manning, Maxwell & Moore, 119 West 40th street. His residence will remain for the present in Somerville, Mass. “Bill” has been traveling a great deal of late and this transfer marks a definite change from the designing to the selling end of the business at which last he has developed marked success.

1903.

MYRON H. CLARK, *Sec.*, 1790 Broadway, New York, N. Y.RALPH H. NUTTER, *Asst. Sec.*, Box 272, Lynn, Mass.

As the *Boston Globe* said in its rush issue the evening of June 14—"Tech is going [but we will put it "has gone"] home. Her sons have seen their Alma Mater moved from her birthplace to the new house across the river. They have celebrated her arrival there with a huge visual symbolism that amounted almost to ritual. They have shaken each other by the hand. They have frolicked together, and at the dinner in Symphony Hall they exchanged greetings by word of mouth with the thousands of their brothers who could not come to Boston. The formalities and the fun are over."

You, no doubt, have seen the voluminous July issue, which was so extensive it had to be printed in two parts; and have learned (those of you who were not there to experience first hand) what a successful, enthusiastic, and deeply impressive ceremony was the reuning time—the dedication of the new Tech which is to mean even more to us in the future that it has in the past, if such can be possible.

For this reason, in the present issue, we'll deal only with the intimate doings of the '03 family, that those who ran may read and relive the exciting and busy moments, and those who weren't able to run may learn what they missed.

The 1903-ers, especially the old Faithfuls, began their celebration with an outing at Bass Point, commencing Saturday noon, June 10, and lasting over until Monday morning until there was just time to get to the "Farewell to Rogers" at 11 in the morning. From then on, there was a bewildering continuance of luncheons, tours, teas, sightseeing—something for everybody and everybody doing something—until at 6 we gathered as a class for our own particular dinner at the Boston City Club. Here we had the best of opportunities to get acquainted with each other once more—what better opportunity than when the spirit of well-being pervades as a result of a good dinner and there's time to "talk of many things." Not only at the dinner but later at the general smoker did our tongues loosen up, so that when we all marched forth to cheer Rogers everyone was in a most jovial and enthusiastic frame of mind.

Though late to bed there was early rising Tuesday for was it not "Nantasket Day?"

The sun came out,
The weather was fine,
And 1903 was right in line.

We were right up-to-date,
In fact ahead of time.
In forecasting the future,
We were quite sublime.

November and the election was our theme. Step right this way, gentlemen. Here comes one of the candidates—calm, aloof, impassive—his attendants, Bryan and Daniels (but where is the army and navy), followed by a jeering, scoffing, motley assembly of goose-stepping Germans and sand-throwing Mexicans. Nothing avails to disturb the calm aloofness of the leader, who, whatever may happen, merely stops to write a few notes to the scoffers, who immediately tear them up.

Though the offenders merely jeered, yet Teddy was “impressed” (we borrowed him from another class). He hastened out with the other candidate to repel the jeering assembly, and was so effective in his fierceness that the scoffers scuttled away to cover, the Mexicans took to their own side of the border, and peace reigned henceforth. Peace in camp, but not peace of mind for that sun had burned our noses until there was hardly any need for lights (each one furnished his own beacon) at almost the most wonderful of all the festivities—the Pageant or Masque of Power—held before the new building that evening when the good ship *Bucentaur* bore the Institute archives across the Charles to their new home on the far side.

As a most fitting climax to three thrilling days came the final banquet at Symphony Hall when everyone gathered from far and near to do Tech honor, to honor its President and the mysterious man who had made possible Tech's new outlook on life, thereby opening up a larger, more vital and far-reaching future for the Institute we all pledge our loyalty to.

When all was said and done and the most enthusiastic reunion one can ever imagine had drawn to a close, and as President MacLaurin bade Technology from New York to San Francisco, from New Orleans to Buffalo, a last “Good-Night”—even so do we, you 1903-ers, merely stopping to give you the roll-call, the story of “Who was there”: L. W. Adams, W. H. Adams, C. S. Aldrich, E. F. Allbright, I. F. Atwood, J. W. Aylsworth, J. F. Ancona, Ross Bates, G. W. Bateman, S. Y. Ball, J. W. Calnan, G. C. Capelle, E. A. Comer, Cox, W. P. Cross, J. A. Cushman, G. C. Danforth, R. W. Daniels, J. J. Dooley, J. F. Doran, M. C. Dunham, Davis, R. W. Eaton, A. H. Eustis, F. A. Eustis, M. Y. Ferris, S. A. Foster, G. H. Gleason, L. B. Gould, H. T. Graber, R. Haskell, I. T. Haddock, J. W. Howard, R. H. Howes, R. F. Jackson, C. M. Joyce, L. C. Kimball, King, A. E. Lang, G. M. MacDonald, R. J. MacGregor, R. Manahan, A. S. Martin, H. C. Merrill, W. E. Mitchell, H. S. Morse, J. A. Nyhen, W. P. Regestein, E. F. Ricker, W. F. Robertson, E. J. Ruxton, T. E. Sears, H. A. Scherrer, A. J. Scholtes, H. A. Stiles, O. S. Swenson, F. T. Thomas, E. C. Thompson, S. A. Tuell, H. H. Valiquet, L. H. Underwood, W. H. Whitcomb, W. L. Wing, G. B. Wood, R. B. Yerxa, M. H. Clark.

The American Synthetic Color Company of Stamford, Conn., is one of the five stations chosen by Technology to furnish oppor-

tunity for advanced students to pursue their studies in specific fields of broadest general importance in chemical engineering. This should be of especial interest to 1903 men as George Bradshaw is president, and R. J. King, vice-president and superintendent. The students will commence their training at the factory soon after the opening of the fall term.—G. F. Loughlin of the United States Geological Survey has an article in the September 14 issue of the *Manufacturing Record* on "Lime for Chemical Industries in the South." He tells us how necessary lime is to the chemical industries of the South and speaks of its distribution and uses.—Mr. and Mrs. Harry Lester Terwilliger announce the marriage of their sister, Helen Louise Pratt, to Mr. Hewitt Crosby on Saturday, the third of June, in Palo Alto, Cal.—Mr. and Mrs. H. B. Pulsifer announce the birth of their son, Verne, July 5, 1916. Address: 506 E. 33 place, Chicago, Ill.

Gleason writes that he has about a dozen copies of our class *Technique* which he would be willing to forward to anybody who will pay the parcel post. His address is 141 Milk street, Boston, Mass.

1904.

HENRY W. STEVENS, *Sec.*, 39 Boylston Street, Boston, Mass.
AMASA M. HOLCOMBE, *Asst. Sec.*, 510 Pine Street, St. Louis, Mo.

Class notes for this issue are very few. In fact, they are so very, very few that they will not much more than prevent 1905 from stepping on the heels of 1903.—Mr. and Mrs. Selskar M. Gunn announced the arrival of a daughter, Barbara Mary, on August 21, 1916. Selskar has given up a metropolitan residence and now lives out in the country, at 60 Goden street, Belmont, Mass.—Edward F. Parker has severed his connection with the Beacon Trust Company, and is now an assistant bank examiner in the New England district.—John F. Card holds the position of vice-president of the Independent Foundry Company, located in Portland, Oregon.—M. V. Paddock is conducting the business of analytical chemist, at 161 Union street, St. John, N. B.—J. Earl Cunningham is with the Ambulance Corps "somewhere in France."—V. H. Elsas is with the Fulton Bag and Cotton Mills of New Orleans, La.—The following clipping from the *Electrical Review* of September 2, 1916, throws some light on the activities of another member of the class:

Mr. Arthur J. Sweet, formerly a member of the firm of Vaughn, Meyer & Sweet, consulting engineers, of Milwaukee, Wis., has withdrawn from that partnership and will conduct individually a consulting practice in steam, electrical and illuminating engineering, with offices in the Palace Theater Building, Milwaukee. Mr. Sweet was at one time commercial engineer of the Holophane Works of General Electric Company, and in that capacity did considerable research work in the field of illuminating engineering. Among other things, he conducted a research for the United States government on postal-car lighting, made under the auspices of the Baltimore & Ohio Railroad Company. He also conducted a similar research

on day-coach lighting for the Association of Railway Electrical Engineers, made under the auspices of the Lake Shore & Michigan Southern Railway. In 1913 Mr. Sweet joined the previously established firm of Vaughn & Meyer in Milwaukee, and since then has devoted much of his time to designing the new system of street lighting for Milwaukee, which is now in course of construction. Mr. Sweet is a recognized authority on this subject and will continue to make a specialty of street-lighting installations. He is a member of the Illuminating Engineering Society and the author of numerous papers on illuminating-engineering problems.

Carle R. Hayward, of the Institute, had a long article in the *Iron Trade Review* of October 12, 1916, dealing with the effects of sulphur in the manufacture of steel. The article is too long for reproduction here but is well worth reading by those interested in such matters.

The secretary requests any classmates who took photographs of any of the '04 activities during the June Reunion, to send a print, or the negatives, to him, in order that they may be used in some future article.

Any negative so sent, will be carefully used and returned to the owner.

In closing these meager notes, the secretary requests each reader to send in at least one item, long or short, for the next issue.

1905.

GROSVENOR D'W. MARCY, *Sec.*, 246 Summer Street, Boston, Mass.
CHARLES W. HAWKES, *Asst. Sec.*, 246 Summer Street, Boston,
Mass.

Nothing very exciting in the way of '05 activities has taken place since the big Reunion. We did attempt to get in a swim at Nantasket during August, but the weather man was against us and Henry Buff, Andie Fisher and the secretary were the only ones who showed up at Rowes Wharf. Andie seemed to think that the water would be fine on such a cloudy dismal day but the trip was given up.

The secretary has recently had a short note from L. T. Buell who is in Autofagasta, Chile. He writes as follows:

Am here as field engineer with the American Metal Company. The South American department is new and the work promises to be varied and interesting.

George C. Thomas, who is with the Singer Company in Podolsk, Russia, says:

I have had some strange experiences since I left England in May. I can't tell you about them now but I can tell you, that when you were raising—— in Boston the first of June, I was frozen in solid away up north and wearing all the clothes I had and drinking a quart of whiskey a day trying to keep reasonably warm. I wanted to send you fellows a cable but couldn't even let my family know where I was. My name isn't Peary and I don't like ice—at least not much of it.

I hear there is an American engineer by the name of Gunn working for the Government in Petrograd. I am going to dig him out shortly and find out if he is of our family.

Thomas, who is way off in Russia, ought to make some of us sit up and take notice in regard to our pleasure for the Alumni Fund. He comments upon '05 showing as follows:

I cannot understand why our returns have been so small. It certainly can't be that so many in our class have failed to respond. I have a small boy whom I hope to send to Tech some day, and if I thought he could spend four years at Tech and come out with so little respect for the place that he wouldn't dig down and dig up something I would start right now and beat him properly.

We don't believe there is any need of young Thomas receiving a beating. Seriously, though, there are a lot of fellows who ought to dig down and send us some money.—We have just had a letter from Mr. H. K. Barrows advising us that Allen H. Barrows, who was in our class, has had a serious nervous breakdown and for several years has not been able to do any work.

—Roy Allen is in Joplin, Mo., and writes that living and working conditions are much more satisfactory than in Mexico. Roy reminds us that the Mexican mine with which he was connected was not operated at all during 1914 and only a little over six months during the latter part of 1915. He writes that he is just completing a mill to treat 400 tons of ore per day and is about to start work on another property developing a mine and building a mill to handle 800 tons of ore per day.—Those of us who were at Osterville were much interested in the work Jules V. Barnd has been handling out in Nevada. For the last five years Barnd has been organizing and developing the American Carrara Marble Company at Carrara, Nye County, Nev. His company owns a deposit of marble over three miles long, half a mile wide, and taking in three mountains. Regarding some of the details he writes as follows:

We had all sorts of handicaps to contend with. Located in the Amargossa Desert, within thirty miles of Death Valley, Cal., without water or power of any kind. At first we used to cart water in barrels at a cost of three cents a quart. Since then we have constructed a ten-mile water system bringing water in at a small cost of operating service. We have built seventeen miles of high tension power line across the desert and in fact we had to build our own town on the desert. Its name is Carrara and you want to watch it grow. All of our houses have running water and electric lights. We have finished construction of a three-mile electric cable gravity tramroad down a 9 per cent. grade from the quarries to the town.

Barnd has certainly got an interesting proposition and has some interesting booklets with pictures of this town in a desert.—Charlie Clapp is still out in the University of Arizona and is also working for the U. S. Geological Survey. He writes us that one of his pastimes is piloting a Ford along the mountains of Arizona and taking care of "two little terrors." The "two terrors" are both boys.—Clarence Gage is in South Milwaukee with the Bucyrus Company. Gage was with Flynn in Panama right after leaving the Institute and has been at South Milwaukee for the last four or five years. He has been recently promoted to the position of

engineer and has charge of the department manufacturing small revolving shovels.

—Louis Killion was on hand for the June Reunion and seems to be just as full of it as ever in spite of the fact that he was married in 1913 and is the father of two girls. Louis used to keep things moving at some of the Tech Show rehearsals and it will take a long time for us to forget the game of Duck-in-the-rock which we played with loaves of bread that had been left at Paine Memorial Hall for some social function which was to take place the evening of one of our rehearsals—enough said for any that were there. Although Killion is located right here in Boston we haven't seen a whole lot of him, but he has promised to do better in the future. In a recent letter Killion tells us that he has given up the idea of building bridges and instead is building cake. He accepted a position with Drake Brothers two or three years ago.

Have given up building bridges to build cake. The opportunity is here and the future looks bright. Have never forgotten the chapter of civil engineering in the old Tech catalog which says "Civil engineering is the broadest of engineering studies." That's the truest and fullest saying in the book. It sure is quite some jump from steel and concrete to cake but there's nothing to it after all.

Lambie is located in Washington, Pa. He was connected with the Pittsburgh Plate Glass Company for some time, but since 1909 has been manufacturing glass, melting pots, and special apparatus for this kind of work.

Jim Barnes has been elected president of the New York Electric Railway Association. The *Orleans American* of Albion, N. Y., says Jim is one of the best railroad men in the state, and that it is certain the association will have new life injected into it with Mr. Barnes at the head.—Joe Daniels spent the summer in Alaska in one of the large mills near Juneau, "To gain experience in one of the biggest mining camps of the world."—Hallet R. Robbins writes from 813 Birks Building, Vancouver, B. C., that he is engaged in some very interesting metallurgical research work for the Granby Consolidated Mining Smelting and Power Company, and hopes any '05 men out that way will look him up.—Bill Spalding is in charge of the efficiency work for the Schoellkopf Aniline & Chemical Works, of Buffalo, N. Y., where a tremendous new plant is being put into operation for the American manufacture of dyes.—A later card from Charlie Clapp, from the Montana School of Mines, Butte, Mont., says:

I have left the hot winds of the desert for the cold blasts of the northern mountains. Some change from 120° in the shade "Where there ain't no shade," to 30° degrees below in the protected valleys where all the slopes are wind swept. However, the mañana spirit that was fast developing demanded heroic treatment. Furthermore, my hopes for a temporary military career, either as an aviator or topographer being shattered, I had to remove myself as far from the temptation as possible. I really have enjoyed the change, and have found the Montana mountains, mines and minerals as interesting as those of Arizona, with the obvious advantages that a new affair always possesses. There are also lots more Tech

men here, some of the real old grads, a few of my former students, and some of the real crowd, such as Ralph Hayden.

The following is from the *Engineering News*:

Albert W. Walker, Assoc. M. Am. Soc. C. E., has been appointed engineer in charge of investigations, plans and estimates of the newly formed Grand Valley Drainage District, with headquarters at Grand Junction, Colo. This district comprises about 50,000 acres of waterlogged land in the Grand Valley. Mr. Walker is a graduate of the Massachusetts Institute of Technology. He has been engaged with the United States Reclamation Service since 1905, for the past three years in charge of drainage on the Huntley irrigation project in Montana.

Mr. and Mrs. Albert H. Smith announce the birth of Barbara Smith on March 14, last.—Robert S. Gardner and Miss Eva Celestia Hungerford were married on May 10 at New London, Conn.—E. H. Lorenz and Miss Grace Peloubet Norton were married in Chicago, June 24. As Mrs. Lorenz' father was a Tech professor, her mother a "coed," and her brother an assistant professor at the Institute, it may be said without exaggeration to be a Tech family.—Professor and Mrs. Selskar Gunn report the arrival of Miss Barbara Mary, born August 21.—Frederick G. Bennett and Miss Grace Kellogg McCabe were married on November 4, and are now at home at Southampton, N. Y.

'05 was represented at Plattsburg by F. G. Bennett and Henry J. Stevenson at the August camp, and the secretary at the September camp. As the next REVIEW is to be a "Preparedness Number," we will hope to have items from these men and every other member of the class who is interested in preparedness, industrial or military.

1907.

BRYANT NICHOLS, *Sec.*, 10 Grand View Road, Chelsea, Mass.

HAROLD S. WONSON, *Asst. Sec.*, Waban, Mass.

No event of class-wide interest has taken place since the last number of the REVIEW, and only a few events in the lives of members of the class have come to the notice of the secretary. These few events are given below.

From James A. Correll, who has been silent regarding his doings for several years, comes word that he is adjunct professor of electrical engineering at University of Texas, Austin, Tex., and that he has three daughters.—B. C. Gupta is now professor of electrical engineering in C. E. College, Sibpur, Howrah, India, being in the Imperial Indian Educational Service. He has held this position since January, 1913. Prior to that time he was an electrical engineer at the Srinagar Substation and Silk Factory in India. He is married to Miss Ethel Colcord of Lynn, Mass., and has three children. His greeting to the class is worthy of notice:

May the class of 1907 be always to the forefront for the propagation of good work that benefits mankind.

Clarence Howe was married on September 16, 1916, to Miss Alice M. Worcester, daughter of J. R. Worcester of Waltham, Mass. His address now is 24 Royston court, Port Arthur, Ont.—Arthur R. Jealous is engaged to Miss Helen Baldwin of Newark, N. J.—Samuel A. Kephart, who was with the class only for one year, but who takes a lively interest in our class affairs, is now a lieutenant-colonel in the Coast Artillery Corps, U. S. A.—A son, Leslie Shaw McMillin was born to Mr. and Mrs. John M. McMillin on July 6, 1916.—“Tucky” (E. P.) Noyes became father of Vivian Greenidge Noyes on September 14, 1916.

1909.

CHARLES R. MAIN, *Sec.*, 201 Devonshire Street, Boston.

GEORGE A. HAYNES, *Asst. Sec.*, 148 High Street, Boston.

Without doubt, those of the class who were unable to be present at the class dinner, held last June in connection with the big Tech Celebration, wondered when they looked for the 1909 class notes in the July number of the REVIEW if they really had the right place. Instead of the customary Carl Gram, secretary, at the top of the page, appeared the name of one not so familiar to the class. As you read on you soon discovered that at the class dinner new class officers had been elected and that after several years of faithful service Carl had been promoted, and a new man had been elected to fill the office of secretary.

And may I add here a personal word to each member of the class. Going to Tech as I did for the last two years only, there are of course several men of the class whom I do not know, but I hope that I may become acquainted eventually with every member of the class, and I trust that the fact that you do not know me personally will not deter you from sending me a line, now and then, telling of your experiences and giving me your latest address. Class notes can only be made interesting and effective by the coöperation of every member of the class. If you will do your part I will do mine.

A collection of Kodak photographs of the class outing at Falmouth Heights, eight in set, and of the general celebration at Nantasket, thirty-five in set, has been gotten together by C. H. Pope, X, from films taken by various members of the class. Unmounted prints may be had at moderate cost by communicating with Charles R. Main, 201 Devonshire street, Boston, who will be glad to quote prices for either one or both of these sets. It is necessary that those desiring prints order them at an early date so that the films may be returned to members of the class who have kindly loaned them for the benefit of the rest of the class.

Since the last report three of the class have joined the ranks of the Benedicts. On the 8th of July, Lester H. (“Let”) King, IV, was married to Miss Isabel Simmons of Brooklyn, N. Y.; on Sep-

tember 20, John N. Boyce, II, was married to Miss Gladys Elizabeth Mosher of Oberlin, Ohio; and, on October 2, Henry K. ("Heine") Spencer, II, was married to Miss Madge Hovey of Winchester, Mass. Congratulations to all!

Delos S. Haynes, VI, is now associated with the firm of Emery, Booth, Janney and Varney, 149 Broadway, New York, where he will continue the practice of patent and trade-mark law.

L. J. Healy, V, has accepted the position of chief chemist of the Federal Rubber Company of Cudahy, Wis. He writes:

I was sorry not to be able to attend the reunion in Boston. About forty of us heard the exercises at Symphony Hall over the phone at the University Club, Milwaukee, and it was perfect. We could hear every word.

Austin D. Keables, II, is now with the Slatersville Finishing Company, Slatersville, R. I., in the capacity of mechanical engineer.—George Miller, III, was recently married to Miss Olive St. Morris of Cobalt, Ont. Mr. and Mrs. Miller will live at Manzan, Cal., where Mr. Miller has been appointed superintendent of a mine.

At the marriage of his brother on August 24, the engagement of Stewart Thomson, V, to Miss Dorothy L. Faunce of Lynn was announced.—On October 14, George H. Reppert, VI, was married to Miss Mildred S. Eccles of Watertown, Mass. They will live in New York City.

Your secretary is happy to announce the birth of a second son, Samuel Frost Main, born on July 15.

Address Changes

Harold F. Ballard, 162 Springdale Ave., East Orange, N. J.—Wallace E. Boardman, Lawrence St., Wakefield, Mass.—Harold D. P. Bounetheau, Technology Chambers, Boston, Mass.—Nathan L. Coleman, Hotel Baker, Polk and Pine Sts., San Francisco, Cal.—Myron M. Davis, 22 Lebanon St., Winchester, Mass.—Leon J. D. Healy, care Federal Rubber Co., Cudahy, Wis.—Lester H. King, 708 East Court St., Flint, Mich.—Mrs. Henrietta Locke Esselen, Jr., 86 Walker Road, Swampscott, Mass.—Paul B. Lord, Box 810, Bisbee, Ariz.—Clarence D. Maynard, 300 Dorchester Ave., South Boston, Mass.—Wilbur A. Meanor, 917 Robson Pritchard Bldg., Huntington, W. Va.—Edward D. Merrill, 1015 Columbia St., Seattle, Wash.—Thurston C. Merriman, 249 Ellsworth Ave., New Haven, Conn.—John Mills, 463 West St., New York, N. Y.—Haylett O'Neill, 200 5th Ave., care W. Va. P. & P. R. R., New York City.—H. W. Paine, 132 Myrtle St., Indian Orchard, Mass.—J. Stewart Pearce, Palace Bldg., Tulsa, Okla.—Albert S. Peet, 31 Milk St., Boston, Mass.—Benjamin W. Pepper, 100 Milk St., Boston, Mass.—Burton H. St. John, 535 North Dearborn Ave., Chicago, Ill.—Frank R. Schell, 460 Riverside Drive, New York, N. Y.—Julius H. Serra, 1598 East 18th St., Brooklyn,

N. Y.—Ralph W. Tuthill, 110 Earl Road, Michigan City, Ind.
 —George N. Varney, 74th St. Place, Bangor, Me.—Harry E. Whitaker, Westinghouse, Church Kerr Co., 165 Broadway, New York, N. Y.—George S. Witmer, care Chile Exploration Co., Chuquicamata, Chile.—Frederick B. Wood, Keyworth Ave., Park Heights, Baltimore, Md.

1911.

ORVILLE B. DENISON, *Sec.*, 63 Sidney Street, Cambridge A, Mass.
 HERBERT FRYER, *Asst. Sec.*, 35 Federal Street, Boston, Mass.

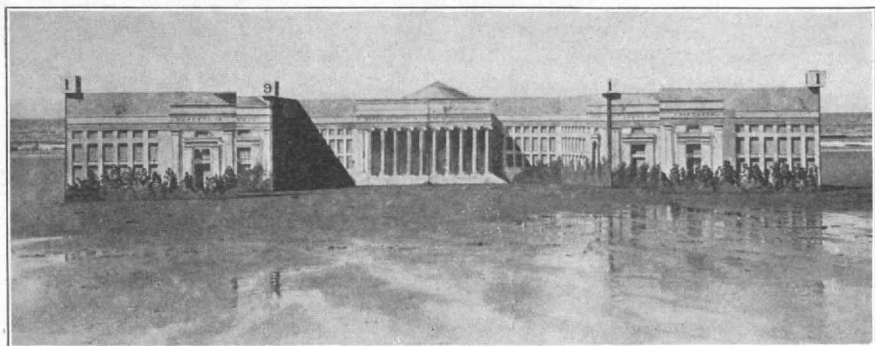
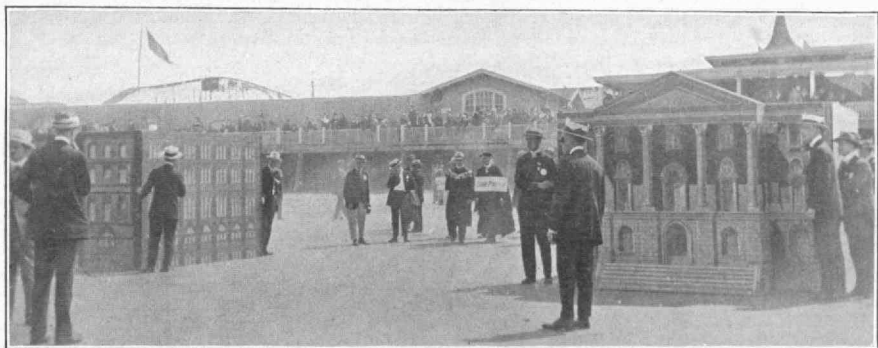
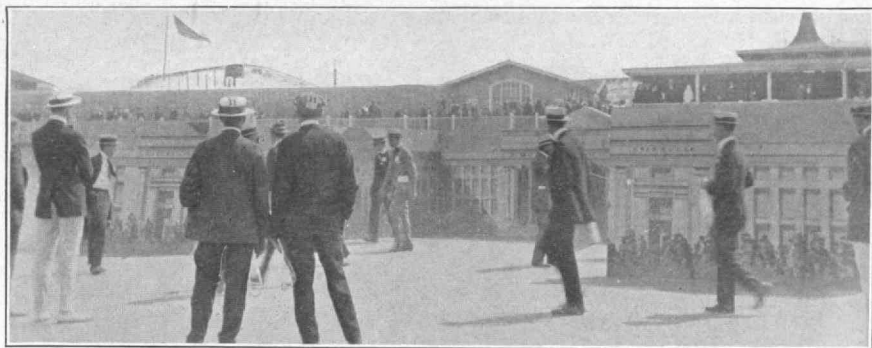
"After the storm comes a calm"—s'pretty lil' sing, isn't it? But used in reference to abundance or dearth of 1911 news it is highly descriptive of an actual fact. In the massive July REVIEW there seemed to be a wealth of live 1911 news, but not so in this issue, almost entirely because the secretary has a pitiful lack of material to work with. Hearken! The secretary has received exactly eight letters from classmates since the Reunion! Let's not let this happen again—that's right, pal, just sit right down, as your conscience dictates, as soon as you finish reading this issue and write to Dennie.—There are two new additions to the 1911 family, one arriving in the West in August and one in the East in September. Mr. and Mrs. Arthur C. Pillsbury announce the arrival of Faith Elizabeth Pillsbury on August 29 in Los Angeles, Cal. Hearty congratulations to both the proud parents!—Mr. and Mrs. G. Arthur Brown announce the arrival of Hammond Brown on September 17, at Manchester, N. H. Again hearty congratulations to the youngster's parents.—One usually speaks of "cause and effect," if the secretary's memory serves him at all well. But here in a somewhat illogical sequence, perchance, the secretary passes from "effect to cause"—witness these two clippings. The first is from the *Boston Journal* of August 9, and reads:

Recent among engagements is that of Miss Gladys M. Smith, the daughter of Mr. and Mrs. Flagg G. Smith of Rochester, N.Y., to Norman Lougee, a graduate of the Massachusetts Institute of Technology, of Salem. Mr. Lougee is now employed by the General Electric Company, Schenectady, N. Y. He is the son of Mr. and Mrs. Arthur L. Lougee of Salem.

Congratulations, Norman, and best wishes for a happy future for you both.—The second clipping referred to above is from one of the metropolitan newspapers of the metropolis of Gardner, Mass., and reads:

The engagement of Miss Julia E. Krantz of Washington, D. C., to Stanford H. Hartshorn of Gardner has just been announced. The two young people became friends while at college, Miss Krantz graduating from the Emerson College of Oratory, and Mr. Hartshorn from the Massachusetts Institute of Technology.

Dat a' boy, Stan! Hearty congratulations to you and your intended. Accompanying the clipping was a note from Hartshorn, together



CLASS OF 1911 AT NANTASKET JUNE 13, 1916

with two splendid snapshots of the 1911 building representations, "before and after." In his optimistic note he says he is still in Gardner in business with his father manufacturing reed furniture and is "still on the map and very much alive."

The following item from the *Boston Transcript* of September 15, is of interest to 1911 men:

Mr. and Mrs. John G. Huettner of 194 Commonwealth avenue, Springfield, announce the marriage of their daughter, Elizabeth, to John Robert Hugelmann of Cambridge and Hartford, Conn. Mr. Hugelmann was graduated from the Massachusetts Institute of Technology with the class of 1911. Mr. and Mrs. Hugelmann have left for a three weeks' wedding trip to be spent in New Hampshire and vicinity and later will make their home in West Hartford, Conn.

Congratulations and best wishes to both bride and groom.—
Another as follows:

In a home wedding attended by more than one hundred and fifty guests from New York, Boston, Leominster and Marlboro, Miss Ruth Alton Faunce, daughter of Mr. and Mrs. Ernest L. Faunce, was married to Roy Loring Hayward, M. I. T., '11, son of Mr. and Mrs. Edward W. Hayward of this city. The ceremony was performed in the home of the bride's parents by the Rev. Albert H. Wheelock of Needham, former pastor of the First Church of Marlboro, Congregational.

The best man was Linwood Draper Faunce, M. I. T., '14, of New York, only brother of the bride, and the matron of honor was Mrs. Fordyce P. Reynolds. Miss Adelaide Faunce, sister of the bride, was trainbearer.

The bride is a graduate of Framingham Normal School and formerly taught in Concord, N. H. Her father is a former president of the Board of Aldermen.

Congratulations, Roy.

On October 28, the *Lynn News* prints the following account of J. A. Herlihy's marriage:

Lynn friends of the groom are in receipt of announcements of the marriage, at St. James rectory, Salem, Thursday evening, of Miss Mabel Florence Ivers, daughter of the late Mr. and Mrs. William J. Ivers of Salem, to John Albert Herlihy, elder son of Mrs. Mary Herlihy and the late Michael Herlihy of this city. Rev. Fr. John J. Gleason, curate of St. James', officiated.

John A. Herlihy, the groom, is deputy grand knight of Valladolid council, 70, Knights of Columbus. He is a graduate of Massachusetts Institute of Technology, '11, and Classical High, '07. Mr. Herlihy holds a responsible engineering position with the Boston plant of the Edison Electric Company. The bride comes of a well known Salem family. She was graduated from Salem Normal school in 1910 and since then has taught at the Cambridge High and Latin school.

The groom's gift to his bride was a pearl necklace, the bride's gift to her maid a string of gold beads and the groom's gift to his best man a Waldemar chain.

Mr. and Mrs. Herlihy left Salem late Thursday evening enroute to New York from where they sailed today for a wedding trip to Bermuda. On their return they will reside at 11 Kerwin street, Dorchester, where they will receive after December 1.

Friends and classmates of S. M. Schmidt will be interested and pleased to read the following from the *Boston Traveler* of July 26:

Prominent Boston Jews and representatives of some of the leading organizations of this city will attend the farewell dinner to be given at the Quincy House tonight to Samuel M. Schmidt, who will relinquish his duties at the West End Evening Centre to become superintendent of the Jewish Settlement House of Cincinnati.

Louis E. Kirstein, vice-chairman of the New England Branch of the American Jewish War Relief Committee, will be toastmaster. The speakers will include Philip Davis of the Civic Service House, Henry H. Levenson, president of the West

End Young Men's Hebrew Association; P. Potash, executive secretary of the Greater Boston People's Relief Committee; Alexander Brin and others. Max Senior, president of the United Jewish Charities of Cincinnati, is expected to attend the dinner. Mr. Schmidt will leave for Cincinnati to take up his new duties Friday morning.

Mr. Schmidt, who is vice-president of the Greater Boston People's Relief Committee for Jewish war sufferers, has been active for the last few years in the affairs of the local Jewish community. He will be in charge of one of the most important Jewish institutions in Cincinnati.

He began earning his living by working in a tailor shop and later in a rubber factory. At the age of 16, while working at the rubber factory, he lost his right arm in one of the machines. When 19 years old he entered business for himself and finally decided to prepare for college, entering the Massachusetts Tech in 1907, where he took the course in biology and public health, graduating in 1911.

During his student years he was a volunteer worker at the Civic Service House and in 1911 organized English classes for immigrants at the Jewish People's Institute. In 1912, '13 and '14 he directed the immigrant classes at the Elizabeth Peabody House. During his senior year he made a housing investigation of Salem, the report of which was published in the report of the associated charities for 1912 and in the eighth volume of contributions of Sanitary Research of M. I. T.

In 1911 and 1912 he was employed as research assistant at the sanitary research laboratory of M. I. T., and in April, 1912, became sanitary inspector for the State Board of Labor and Industries. The two positions as inspector have given him opportunity to come in direct contact with home conditions as well as with the working environment of the laboring classes. This opportunity has supplemented his training for social service work.

In 1914 Mr. Schmidt was appointed manager of the West End Evening Centre, which position he still holds.

He is a member of the American Public Health Association, the Massachusetts Association of Boards of Health, Advocates of Zion, and is a director of the West End Young Men's Hebrew Association.

The Jewish settlement house of Cincinnati includes boys' and girls' industrial school, convalescent home, bureau of Jewish social service, general Jewish relief, dispensary, Foster home, child welfare station, children's clubs, men's and women's clubs, English and citizenship classes.

Mrs. Schmidt will be associated with her husband in the new work.

Two other splendid snaps of Reunion 1911 activities have been sent in by Dick Ranger—one showing the head of the 1911 contingent in the parade and the other showing the representation of the New Technology with the ocean as a background. If possible these four pictures are to be presented with this article, for they should be of interest to all 1911 men.—Charlie Barker has been sent to their Chicago sales district by the Norton Company of Worcester, manufacturers of grinding wheels and abrasives. At this writing he has not left, but he can be reached by addressing his mail to Norton Company, Worcester, Mass., to be forwarded. Careful now, Gus, remember Chicago is a big city with its many dangers!—C. B. Magrath, a classmate, is with the Canadian forces "somewhere in France," so his correspondent has advised the secretary.—L. P. Ferris, VI, is still with the A. T. & T. people in the far West, but expects to be back in New York by the first of the year.—Pedro de Souza Leões has changed his abode in Brazil, and is now located in Ceará. Pedro is a good correspondent and maintains a vigorous interest in affairs concerning Tech, and especially Tech '11. If your hand doesn't get tired writing his long address on the

envelope, just drop him a few lines, if you ever knew him. It would tickle him to death.—“Joe” Gershberg is back in the fold. All Course VI men will certainly remember him, and, although he did not receive his degree until 1912, he wants to be classed as a 1911-er. Accordingly the secretary has notified the Alumni Association secretary and “Joe” is a full-fledged member of our band once more. He is with the G. E. Co. in Lynn.—Jack McAllen has gone to Alaska. When you read his address later, don’t get excited. He is not “Kink” of Alaska, but *at* Kink, Alaska. Got any new stuff, Jack, from which Robert W. Service can make some new poems a la Dan McGrew?—Here’s a letter, originally addressed to Professor Richards at the Institute, from Jack. It is most interesting:

You may be interested in hearing of our experiences in constructing a stampmill in this district.

We left Seattle March 15 and went to Seward by steamer. From Seward we walked to the mine, over the snow, a distance of 200 miles. I was in charge of the party as the manager of the mine was ill and could not come and a new man had not yet been found to take his place.

We reached the mine April 3 and went to work at once. There was seven feet of snow, all of which had to be shoveled away. The mill building was up with seven stamps in it. We had to put in five more stamps and rebuild the mill.

First we put up a little portable sawmill capable of turning out 3,000 feet of lumber a day. After this was in running order we had to wait for the thaw to come before we should have power to run it as we were dependent on water power. When the water came we turned out the lumber in a hurry.

In the stampmill were one five-stamp battery and one two-stamp battery. We were to put in another five-stamp battery. I decided to move the two-stamp to one side and put the new battery in between the two old ones. We dismantled the two-stamp and picked up the mortar with a chain block and lowered it into the hole which had been dug to receive it. We then enlarged the old hole and built the block for the new mortar in it. The mill was originally bought by a company which went broke and we took it off Hedy’s hands. The mill was for concrete mortar block and had 850-pound stamps. We ordered heavier stems and boss heads to bring the weight to 1,050 pounds and also new timbers so we could use a wood mortar block. All these goods were held up at Anchorage last fall by the ice though and we did not have them. Perhaps you remember the trouble they had in Cook Inlet last year when the boat was carried away by the ice and left her passengers at Anchorage to walk to Seward over the snow a distance of 150 miles. At any rate we did not have the king posts and other timbers suitable for use with a wood mortar block and did not have the cement to make a concrete block. We went ahead and built a big block out of wood and set the post sockets and king posts on top of it. The block was built of 7” x 7” timbers. Not very large but the biggest stuff we could get out of the saw logs we had.

We put a two compartment hydraulic classifier in the mill and discharged the first compartment to Wilfley No. 1 and the second to Wilfley No. 2. The Wilfley tailing is elevated by a centrifugal pump and sent to leaching tanks for cyanide treatment. The Wilfley concentrate is stored to be cyanided at the end of the season. The concentrate is not reground. The classifier overflow is sent to storage ponds for future treatment.

The worst thing we were up against this spring was the problem of food. We came in here on April 1, expecting to be able to get food in on pack horses by the middle of May and certainly not later than the 25th of May. It was not until the 15th of June though that we were able to get supplies in. The result was that we were out of fresh food for a long time and came pretty close to being out of meat of any kind, even ham and bacon.

We are near Anchorage, where the government is doing most of its work on the railroad under the direction of William C. Edes. Anchorage is only a year old and has graded streets, sidewalks, concrete buildings, and many other signs of civilization.

The work here is very interesting and the wages are good. One great drawback is the short season which is usually about five months and never over six.

A Mr. J. H. Collier of Oakland is now the manager of the property. He came in on June 25, after the mill had been running for a month, so he missed the really hard part of the season.

Last year we treated nearly 3,000 tons and recovered \$137,000. You can see from this that the ore is very high grade.

—Bill Coburn has associated himself with Marshall & Company, bankers, 70 State street, Boston, as a bond salesman. Good luck, Bill, in your new venture.—Did any of you 1911-ers notice a photo, in any of the various Associated Press newspapers, of an automobile driven out to the edge of Hanging Rock in Yosemite Valley, California? The papers had the picture on or about November 8. Well, if you saw it, you should know that the man who drove the car was none other than Art Pillsbury, a classmate. What's the idea, Art, did the momentum you acquired at the Reunion carry you right up to the "jumping-off place?"—The following clipping from *Town Topics* of October 19, under the caption "Donald C. Bakewell," should prove of interest to his 1911 classmates:

Pennsylvania's great steel manufacturing industry has in the past decade or so increased by leaps and bounds, until today it has become a colossus among businesses. Needless to say, it is an industry that has drawn to it many able men, some of whom, starting at the foot of the ladder and going through every department of the business, have achieved success as executives, engineers or forge masters.

Such a man is Donald C. Bakewell, a manufacturer of steel castings and well known throughout Pennsylvania in steel circles. Born in Salem, Ohio, on December 5, 1887, he is a son of Thomas H. and Annie (Mullins) Bakewell.

After attending public schools and receiving the usual preliminary educational training, young Bakewell was sent to college at New Haven, and he is a graduate of Yale University, class of '08, where he won an A. B. degree.

Two years later Mr. Bakewell graduated from the Massachusetts Institute of Technology and entered the steel industry.

He is now the assistant superintendent of the Duquesne Steel Foundry Company, and a director in the Pittsburgh Forge & Iron Co.

Mr. Bakewell makes his home at Sewickley, Pa., and his club and society affiliations include the Allegheny Country Club, the Yale Club of New York, and the Engineers' Society of Western Pennsylvania.

He is fond of the outdoors, of athletics and the majority of healthful sports, and is popular in Pittsburgh's social and business circles.

Aviation for August, 1916, publishes the following item of interest to the class:

With the commencement of the autumn session, courses in aeronautics will be given at the College of Mechanical Engineering, University of Illinois. E. N. Fales, a graduate of the Massachusetts Institute of Technology, has been appointed assistant professor. The courses, which will be of a general nature, will be restricted to senior students of the mechanical engineering class.

Mr. Fales experimented in the first wind tunnel at the M. I. T., has kept in

touch with all aspects of aeronautics, and is now leaving the engineering department of the Curtiss Company, where among other duties he has been in charge of the students' department.

—Now for the address changes, closing a very short set of 1911 news, for whose brevity the secretary, although somewhat blameless, is nevertheless disappointed.

Address Changes

C. L. Bartlett, Alcoa, Blount Co., Tenn.—G. Arthur Brown, 97 Liberty St., Manchester, N. H.—M. B. Brownlee, Jr., 800 Asylum Ave., Hartford, Conn.—H. M. Davis, 26 Beals St., Brookline, Mass.—L. P. Ferris, Pacific Tel. & Tel. Co., San Francisco, Cal. (until Jan. 1, 1917).—W. E. Fortune, 85 Heath St., Boston.—Joseph Gershberg, 15 Falls St., East Lynn, Mass.—Pedro de Souza Leão, Quartel em Fortaleza, 46 Bm de Caçadores, 2a Comp., Ceará, Brazil, S. A.—J. L. McAllen, Mining Engineer, Kink, Alaska.—Leonard O. Mills, 1425 Cedar St., Milwaukee, Wis.—I. F. Morrison, 87 Middle St., Braintree, Mass.—G. S. Watson, 313 N. Texas Bldg., Dallas, Tex.—Henry Wood, Naragansett Worsted Mills, Warren, R. I.

The following 1911 address changes reached the secretary just in time to be appended to the notes herewith:

Walter D. Allen, 524 Gurdon St., Bridgeport, Conn.—Kester Barr, 154 Highland Ave., Buffalo, N. Y.—Royal M. Barton, care of Metropolitan Electric Co., 14 S. 5th St., Reading, Pa.—Suren Bogdasarian, 207 W. Baird Ave., Barberton, Ohio.—O. H. Chase, care of American Mutual Liability Ins. Co., 293 Bridge St., Springfield, Mass.—Wm. H. Coburn, Waverley, Mass.—George B. Curwen, 354 Delaware Ave., Palmerton, Pa.—P. A. Cushman, 38 Stedman St., Brookline, Mass.—S. A. Francis, 336 Vinewood Ave., Detroit, Mich.—J. O. Greenan, 805 Crocker Bldg., San Francisco, Cal.—R. T. Haslam, 1294 Nicholson St., Cleveland, Ohio.—W. K. Hodgman, Jr., 19 Cedar St., Taunton, Mass.—Theodorus Polhemus, Longhorn Mine, Benton, Wis.—S. M. Schmidt, 415 Clinton St., Cincinnati, Ohio.—J. B. Walcott, 19 Congress St., Boston, Mass.—Noyes Weltmer, care of Jacob Weltmer, Santa Fe, New Mexico.—Peter D. White, 105 E. Baird Ave., Barberton, Ohio.

1912.

J. E. WHITTLESEY, *Sec.*, 147 Milk Street, Boston, Mass.

In looking over the July REVIEW to pick up the threads I noticed that one stunt was somewhat ambiguously described. Jonah was impersonated by little shorty Wiseman, Course VI, and not the Wise man of Harvard as one would be led to believe. However, I think the editor's correction worthy of note.

Marriage stock is still above par, along with all the other war babies and "bonds."

Clarence E. Morrow was married September 14 to Miss Lou Hostetler Spaulding of Brookline, Mass. He is spending part of his time teaching back at the "Stute" and the rest with Stone & Webster Eng. Corp., where he has charge of all their concrete drawings.—Through the local papers of September 30, we hear of the marriage of H. D. Walker:

The marriage of Miss Corrina Searle, only daughter of Mr. and Mrs. C. P. Searle of 280 Commonwealth avenue, Boston, and Ipswich, to Harold D. Walker, son of Mr. and Mrs. C. Howard Walker of 13 Walnut street, Boston, and Dublin, N. H., took place at "Inglesby," the Ipswich estate of the Searle family, this afternoon at 1 o'clock. The ceremony was performed by Rev. Robert B. Parker, rector of the Ascension Memorial Church of Ipswich, assisted by Rev. Samuel McCoomb of Washington, D. C.

After the ceremony a reception was held, Mrs. Walker and Mrs. Searle assisting in receiving. Following the reception there was dancing.

The Searle mansion was handsomely decorated, the colors being entirely green and white. The bride and groom received many gifts in gold, silver, cut glass, art, linen, china, etc.

The groom is a Harvard man, 1909, and Massachusetts Institute of Technology. He is a member of the Harvard Club and the Union Boat Club. The bride is a debutante of 1914 and a member of the Sewing Circle of that year.

They left on a three weeks' motor trip and upon their return will reside at 18 Fairfield street, Boston. The wedding was the last of the North Shore society weddings and was attended by several hundred guests from all points along the North Shore, Boston, Cambridge and New York.

Another wedding of recent date follows:

Miss Florence Myrtle Baldwin of Hallstead, Pa., and Horace S. Payson of Boston were united in marriage in the home of the bride's sister, Mrs. R. K. Pratt, 121 Bay street. Rev. Dr. John Lyon Caughey performed the ceremony. Only the immediate relatives and friends were present.

Miss Baldwin is a graduate of the Binghamton City Hospital Nurses' Training School, class of 1914. Mr. Payson is a graduate of the Massachusetts Institute of Technology, class of 1912, and is now an employee of the International Paper Company in New York City.

After a wedding trip of a few days in the Connecticut valley, Mr. and Mrs. Payson will be at home at 70 North Willow street, Montclair, N. J.

Also a third:

Miss Dorothy Williams, daughter of Mr. and Mrs. Francis H. Williams of 11 Glenwood avenue, Newton Centre, was married to John Eddy Whittlesey of West Newton, son of Henry Whittlesey, a Boston attorney, at the Newton Centre Baptist Church. The Rev. Dr. Emory Hunt, pastor of the church, officiated.

A feature of the occasion was a wedding march, dedicated to the bride by its composer, John Herman Loud. Mr. Loud played the march and also gave an organ recital before the ceremony.

The maid of honor was Miss Priscilla Alden Williams, sister of the bride, and the bridesmaids were Miss Helen Copeland of Newton Centre and Miss Miriam Swett of Melrose. Miss Barbara Marston of Newton Centre was flower girl, and the best man was Harvey Benson of Melrose Highlands. The ushers were: Ellis W. Brewster of Plymouth, Carleton M. Burr of Newton Centre, Harry N. Sandell of Dorchester, Dr. Thomas Almy of Fall River, Walton S. Redfield of West Newton and Harold E. Kebbon of Boston.

Mr. Whittlesey, who was graduated from the Massachusetts Institute of Technology in 1912, is connected with Stone & Webster. On returning from an automobile tour, the couple will reside in Wellesley Hills.

The *Electric Railway Journal* under date of October 28, published the following:

D. J. McGrath, for the last two years research assistant in the electrical engineering department of the Massachusetts Institute of Technology, has severed his connection with the Institute and joined the staff of the Boston (Mass.) Elevated Railway. Mr. McGrath has been made a special assistant to M. C. Brush, president of the company, in connection with the revenue inquiry now being conducted into the company's affairs by the legislative recess commission established for that purpose. Mr. McGrath is the author of a number of notable articles on electric railway economics, with special reference to fare problems, and before leaving the Institute was occupied with the preparation of a report summarizing the investigations of the department upon electric railway costs and revenues in the past two or three years. At the mid-year meeting of the American Electric Railway Association on February 4, 1916, Mr. McGrath presented a notable paper dealing with the return on Massachusetts investments.

McGrath, who did such good work on the stunt, writes an interesting letter. It's too bad he did not have his job when we were at the "Stute." He is safe in his invitation for kicks now:

Just a line to notify you that I am no longer "researching" at M. I. T., on the "purely economic" problem of how far a passenger can be carried for 5 cents on the street railways, as was reported in last April's REVIEW. My efforts at solving street railway problems are now directed more specifically, and perhaps more practically, to the well-known Boston "L" where I am acting as special assistant to one real live Tech man, President Matthew C. Brush, '01. From the easy-going, calm, and unruffled life of a research man, to the employ of a big corporation, under a hustler like "Mat" Brush, is some change, but one which I was very glad to make.

Now all the fellows who have a kick against the transportation company can write to me. This invitation ought not to bring me more than two hundred letters per day.

It's surprising how many Tech men have been connected with the European war in some way or other. I wish I had some word from H. R. L. Fox who, when I last heard, was waiting to be sent to France. All '12 men to date, however, have been with the Entente. Here's another, under heading of the *Canadian Mining Institute Bulletin*, July, 1916. I wonder who will be next:

On May 25 the *Daily Colonist*, Victoria, B. C., published the following information: "Recognizing the need of men for war service, Prof. Stuart J. Schofield, M. A., Ph. D., head of the Department of Geology at the University of British Columbia, has enlisted in the ranks of the British Columbia Company of the Western Universities Battalion as a private. He joined last Tuesday with the splendid aggregation of collegians who are going to do their 'bit.' His example will no doubt give a big stimulus to recruiting for this distinctive unit which is now rapidly nearing its complete strength of 250. Nearly 200 have already enlisted. Professor Schofield has had a noteworthy career. Before joining the staff of the University he was with the Dominion Geological Survey and conducted a number of important surveys. A graduate of Queen's University, he secured honors at other educational institutions, including the Boston School of Technology. He held a commission in the 3rd Field Company of the Canadian Engineers while resident in Ottawa before coming to the Pacific coast."

The following paragraph on cork insulation, which I noticed in *Power*, and which is very interesting, shows at least we have one famous man. This address was given by C. B. Rowley, before the Cleveland Engineering Society:

Cork for cold-storage insulation is chiefly a byproduct of the cork-stopper industry. The raw product is the bark of the cork oak, native in the Mediterranean countries. At the age of thirty years the bark is of sufficient thickness to be stripped and, unlike most trees, removing the bark aids the growth and prolongs the life of the tree. The bark is first boiled to remove the dirt and impurities, during which process its volume is increased about 25 per cent. It is then shipped to the manufacturers of cork products, where the best material is used for making cork stoppers and the like; but the enormous waste, amounting to 60 to 70 per cent., together with the coarser pieces of bark, goes to make up sheets of insulation, principally used for cold-storage work.

After the cork has been sized and cleansed (free from dust), it is placed in steel molds and there compressed. While under pressure the cork is thoroughly baked and then gradually allowed to cool. This baking process drives out the moisture and causes the natural sap to form a glue, which binds all the particles into a homogeneous mass. By driving out the moisture and destroying the impurities by the heat treatment, more air cells result and consequently a more efficient insulator is produced. Turning the sap into a glue greatly increases the water-proofing qualities, which is one of the large factors to be thought of in choosing an insulating material.

After being removed from the mold, the edges of the cork sheets have to be trimmed and trued up into sheets 3 ft. long, 1 ft. wide, standard thicknesses of 2 in., 3 in. or 4 in. Other forms of cork board are made where the particles are united by means of asphalt and formed into sheets of the same size as those described.

Weenie Schell, with his true musical ability, is now treasurer of the Henry F. Miller & Sons Piano Co.

This coming season I want to try the following scheme of keeping in touch with 1912—to have a class dinner in Boston when the class news is due. Each man who always keeps in touch with one or two others should have several interesting items. I would also like to have the '12 men in other cities have meetings at the same time and also collect the news of other sections. I am going to write several of the men at the proper time and I ask you all to help.

From the *Eastern Chronicle*, New Glasgow, Nova Scotia, September 5, 1916, comes the sad tidings of Harry Cavanagh's death. We quote as follows:

"Startling was the cable received on Monday evening by Mr. H. T. Sutherland, from his daughter, Mrs. Major Trotter, London, Eng., stating 'Harry Cavanagh dead.' The news was conveyed to Mr. and Mrs. Cavanagh and family and naturally the shock was heavy and the grief is great.

"Just a few days ago Mr. Cavanagh received word that Harry was wounded, but not seriously, and was in a London hospital. Nothing further up to the message last night had been heard and nothing expected until the mails would bring a letter telling of his condition. Last night's brief cable changed all and brought deep-felt sorrow to all who knew the young officer and his family.

"He was the eldest son of Postmaster Cavanagh and enlisted with the engineers well over a year ago, training at Ottawa and going overseas from there. Since reaching the other side he has seen a great deal of active service in charge of an engineering force,

and was apparently largely employed in keeping the railway communications in touch with the front line trenches.

"In a letter his father had from him a few days ago and evidently written but a short time before he received the fatal wound, he described a German dugout which had been wrested from the enemy. How it was forty feet underground, fitted with electric lights, supplied with hot and cold water, possessed a cooking range and other comforts. He also enclosed a page from a German newspaper found in the underground quarters.

"Prior to enlisting Lieut. Cavanagh was a civil engineer on the staff of the N. S. Steel and Coal Company, and it was fully acknowledged that he was one of the most capable and promising construction engineers that the company ever had in its service. Naturally clever, he had fitted himself for engineering work with a college education and had acquired a valuable practical experience in many fields. So well equipped, it is not to be wondered at that enlisting as a private he soon secured a commission and was early valuable in the Canadian engineering force in Flanders.

"Our townspeople mourn with the grief stricken parents and sisters and Lieut. John Cavanagh, attached to the Headquarters' Staff at Halifax, who is an only brother. The terribleness of the terrible war is being brought daily nearer to us and made the more fearful when young lives, full of every promise and rich in close friendships, go out in behalf of the struggle for freedom and right.

"Harry Cavanagh was born in New Glasgow, February 5, 1886. He was educated in the New Glasgow public schools and at Dalhousie University, where he was graduated in civil engineering in 1908. The following year he was draughtsman with the Virginia Bridge and Iron Co., Roanoke, Va. Returning home he joined the engineering staff of the Nova Scotia Steel & Coal Co., and carried out some important work at their iron mines at Wabana, Nfld. In 1912 he was a special student at the Massachusetts Institute of Technology at Boston. When the Eastern Car Works were under construction he was assistant to Mr. H. H. Lane, the chief engineer of that work. When the war broke out he offered his services. In December, 1914, he enlisted at Ottawa as a sapper in the Signal Corps of the Canadian Engineers. A few months later he was given a lieutenant's commission and employed in the engineers training depot at Ottawa. In October, 1915, he went to England with his company. Since January he has been in France and Belgium, actively employed until wounded on August 24. He died of wounds at Mrs. Arnold's Hospital, London, on September 4."

In an article, entitled "In Memory of Lafayette," *Munsey's Magazine* for November devotes several pages to the lives and services of young Americans who have died in the cause of France. Kenneth Weeks of our class, who fell last summer fighting in the Foreign Legion, is among those mentioned, as follows:

Kenneth Weeks, a graduate of Massachusetts Institute of Technology, and a member of the Delta Kappa Epsilon. He was but twenty-six, yet he had written several delightful volumes of essays and stories, and a number of plays. He was in the Beaux Arts, studying architecture, when the war began. He was one of the first to enlist.

Time after time he was mentioned for bravery. Throughout the long, terrific pounding to which the Foreign Legion was subjected, this young poet and philosopher from the land of Emerson fought as young Israel Putnam might have fought. He became the bomb-thrower of his squad.

Then at last came word that practically the whole American contingent in the Foreign Legion had been mustered out—by death, by wounds, by those other honors previously referred to. Theirs has been but a tiny contribution, perhaps, to the sum total of the great war's ultimate results; just as have been the contributions of those other Americans who couldn't possibly remain neutral in face of the great tradition of Lafayette.

1913.

F. D. MURDOCK, *Sec.*, 685 Lafayette Avenue, Buffalo, N. Y.

A. W. KENNEY, *Assoc. Sec.*, M. I. T., Cambridge, Mass.

The engagements of H. P. Fessenden, I, and S. E. Rogers, II, are announced, the former to Eleanor Dresser of Brookline, and the latter to Margaret Vaughn Salter of Duluth, Minn.—Raymond Elcock, XIX, was married in September to Anna Louise Keefe of Dorchester.—Course X has lost two of its benedicts in the persons of Daniel Lewis, the famous son of Mauch Chunk; and Joe Cohen, the impassioned orator in favor of socialism. Miss Rose Stone was married to Joe on July 16, in Roxbury. Miss Anna E. Smith became Daniel's bride in New York city on November 2. After the 15th of November they will be at home at 445 Prospect street, Newark, N. J.—Notice is served that we are about to lose another good man. Announcement has been made of the engagement of Miss Margaret V. Salter to our old friend Sammy Rogers, II. How we can ever celebrate another reunion without Sammy's help it is hard to see.—Our loyal classmate Harold Rand, I, has joined the ranks of happy men. His engagement was announced in the class notes some time ago; and on October 24 Miss Alice M. Bryant and Rand were married. They are spending their honeymoon in the South, but after the first of December they will be at home at 23 Conway street, Roslindale. The class certainly wishes them the best of good luck.—The presses had to be stopped so that the news of another wedding might be added to this column. Miss Eleanor Presser was married on November 17 to Mr. Howard Pike Fessenden, I, commonly known as "Fezzy." Fezzy's new address will be 95 Pleasant street, Newton Centre, Mass., after January 1. The following class babies are introduced: Albion Davis, I, daughter Eleanor; Marion Charlotte Brett and Harry Peck's male offspring, who, when we heard from Hap, had not yet been named.

Due to the efforts of Jack Rankin, VI, and Dutch Gotherman, VI, a class dinner was celebrated in July at the Tech Club in New

York. The fellows who were lucky enough to be there enjoyed a real ventriloquist act performed by Jack and Dutch. Somewhere they got hold of an electrically operated ventriloquist's dummy. Dutch was the stage performer and Jack sat down in the kitchen at the club and did the talking for the dummy, via a loud speaking telephone set, and also worked the dummy's mouth, head and arms by means of relays and solenoids. The fellows thought that Gotherman was quite a wonderful ventriloquist, until Jack had the indiscretion to allow himself to lapse into song. And, pray, who once having felt the aural sensations on hearing that otherwise gifted lad sing could ever forget it? That dispelled the illusion and broke up the party. We hope to hear of more affairs of this kind. Several live men of our class are always ready to start something and to facilitate rounding up the crowd, thirteen men in New York and vicinity are earnestly asked to keep their addresses on file at the club in Gramercy Park.

Maurice Levy, I, with the coast survey, has had some interesting experiences. He writes from the Philippines:

The first two years after graduation I spent on the West coast—summers in Alaska and in Seattle during the winter. (While in the city I met several older Tech men.) The wanderlust was strong upon me then (very tragic). I thought I got pretty much my fill during the summer of 1914, having had occasion to be at nearly all the places in the Alaskan coast now famous in fiction. During June, July, and August of that year we surveyed the approaches to Anchorage—the headquarters of the Alaska Railroad Commission—and up to the mouth of Matanuska River (of coal fields fame). Of course you know W. C. Edes, chairman of the Alaska Commission, is a Tech man. I met him quite often and later in the season was along on one of his reconnaissance trips. Aside from other considerations, that was a trip worth several thousand miles of other travel. The country is a veritable geologist's paradise (whatever that is)—glaciers and everything else.

The summer of 1915 had nothing attractive for us. Our party was stuck away on the Shumagin Islands, a bunch of rocky islands swept barren of nearly all vegetation by the winds coming over the snow-covered Alaska peninsula. We did not see another human being outside of the party for nearly five months (except one Indian). When I could do nothing else, and time was all my own, I amused myself with building toy weirs across mountain streams to get the flow (but say, Fred, don't mention this to anybody. Only a chap in despair and longing for the bright lights would do anything as nutty).

However, I'm now in an extremely opposite corner of the sphere (spheroid, to be a trifle more correct). Latitude 7° N., Longitude 117° E. and sixty miles north of Borneo.

With us on the steamer across the Pacific was E. R. Hyde, '06, coming out to do some bridge work for the governor.

Ober and Shaw, both '14 men and in the coast survey, were there, too. There's another '06 man, Course I, in Manila—came out in February, 1916, I can't think of his name—(lapse of memory is a disease acquired in the Islands).

On March 3, 1916, while driving, the jitney nearly collided with another. Before deciding to swear I looked at the occupant of the other vehicle. Who should it be but Salibee, '13, looking gay and jovial. You have doubtless heard from him so I shall not volunteer any information.

I have cause to envy you folks living in a white man's country with all the beautiful distractions going loose and the Tech Reunion coming on. However, I wish you joy and silently hope that some one will "turn down an empty glass" for me at the next class dinner.

At least two brave men of the class are helping to defend the border. Bill Mattson, I, is with the First Corps Cadets of Boston, and Bob Weeks, VI, is with the Seventh regiment of the New York National Guard.—Ralph Howes, X, had an unfortunate attack of typhoid fever this summer from the effects of which he is now slowly recovering at Saranac Lake. He is a doughty lad and will come through all right.—Somewhere it has leaked out that our scholastic associate secretary has at last overcome all the obstacles which have long stood in the way of his successful performance of that classical chemical experiment, “the action of steam upon copper oxide,” assigned by Tommy Pope in the year 1909. Wherefore are Arthur’s friends much rejoiced. He made his bow to the scientific fraternity this month in a paper to the American Society of Refrigerating Engineers, on the subject of the “Thermodynamic Properties of Carbon Dioxide.”—Walter Brown, XI, resigned this summer from the U. S. Public Health Service and entered the employ of the Johns-Manville Co., in the acoustical department. Walter’s work is in connection with the development and manufacture of a new artificial acoustical stone.—Bob Nichols, I, looms up in Washington, D. C., where he is employed by the Navy Department, using his civil engineering training on the problems which have to be solved in that big department.—Sam Rogers, II, is now an insurance engineer at 65 Kilby Street, Boston.

1914.

C. J. CALLAHAN, *Sec.*, 14 Prospect Street, Lawrence, Mass.
ELMER E. DAWSON, JR., *Asst. Sec.*, 28 Washington Avenue, Winthrop, Mass.

On Monday, June 12, eighty-five members of the class sat down to the Reunion dinner at the Hotel Bellevue. It surely was a pleasant surprise to see how well the fellows turned out, and to hear how well they were all doing. The prize for coming the longest distance was awarded to Long Lau, III, who came all the way from Cuba.

After having cleaned up everything in front of him, and thus gained the necessary courage, Charlie Fiske arose, shuffled his feet, took another hitch in his trousers and said:—“Fellows, I’m going to be mighty busy after next week. I’m going to get married, and I fear that I shall not have sufficient time to devote to the duties of secretary of the class. I’m sorry—that is; I’m sorry that I can’t remain as your secretary, but a fellow can’t get married and be your secretary too.” Having delivered this speech with great gusto, Charles sat down. Then up rose Buck Dorrance who said, “I know a fellow for the job. He has been in New York for a year and no one married him. In fact I’m sure that no one will ever marry him. Let’s give the job to a fellow whom we can trust to

stick on the job. Let's give it to C. J. Callahan." Then the class unanimously agreed that no one would ever think of marrying this fellow, and that the job should be given to him.

Under such auspicious circumstances, your present secretary was ushered into his new office. It is with fear and trembling that he takes up his tasks. He will attempt to maintain the high standard set by his predecessor, knowing that if he fails he can always relieve himself of his burden by plunging blindly into the stormy sea of matrimony. Many thanks, Charles, for having shown us the way, however hard or trying that way may be.

While we are on this subject of matrimony, we may as well list the bravest. The Clinton (Mass.) *Courant* of September 8 printed the following:

The home of William C. Freeman on Warren street, Needham, was the scene of a pretty wedding, Thursday, August 31, when his only daughter, Miss Estelle Louise Freeman, Simmons, '16, was married to Earle Oliver Turner, son of Mr. and Mrs. Arthur H. Turner of Harvard. The house was prettily decorated with clematis, wistaria and green foliage and the bridal party stood before a bank of green and white in the same room where the parents of the bride were married twenty-six years ago.

The groom has been in the employ of the State highway commission. In the fall he will take charge of the engineering department in the Brooklyn (N. Y.) Polytechnic School.

The Worcester *Telegram* of August 3 prints the following:

In Worcester, on Tuesday, Vernon M. F. Tallman, son of Mr. and Mrs. Chester B. Tallman of Newport, R. I., and Miss Phyllis E. Thayer, daughter of Mr. and Mrs. William P. Thayer of 515 Grove street, Worcester, were married in the home of the bride by Rev. Edward Payson Drew, D. D., pastor of Old South Church, Worcester. Mr. Tallman, who is a graduate of M. I. T., in the class of 1914, is tenor soloist at Old South Church. After an automobile wedding trip Mr. and Mrs. Tallman will live at The Standish, in Worcester. They will be at home after November 1.

Mrs. Josephine Lagarde Sears of Dorchester, Mass., announces the marriage of her daughter, Mildred Menton, to Ernest Mathew Boyd, II, on Thursday, June 15.—The Boston *Post* of June 17 scooped the city with the marriage of Marie Elizabeth Blood, to Charles Parker Fiske, II.—Mr. and Mrs. Frank Charlton Stowe announce the marriage of their daughter, Millicent Lucy, to Charles Shepard Lee, II, on Saturday evening, July 22. The wedding took place at St. James' Episcopal Church, New London, Conn. The happy couple will be at home after September 1 at Douglas, Ariz.—This from the Boston *Traveler* on August 7, concerning Claire Ricker, VI:

The engagement is announced of Miss Gladys Judkins DeWolf, a popular West Somerville girl, and Claire W. Ricker of Pasadena, Cal.

Miss DeWolf is the younger daughter of Mr. and Mrs. Israel H. DeWolf of 47 Electric avenue, West Somerville. She was graduated from the Somerville High School in 1914, and took up a course in a kindergarten training school, from which she was graduated this year. Her father is a member of the G. A. R., adjutant of Post 139 of Somerville and clerk of the G. A. R. headquarters at the State House.

When about to come East to begin his studies at the Massachusetts Institute of

Technology, Mr. Ricker obtained a letter of introduction from the brother of Mr. DeWolf at Santa Ana, Cal., to the latter. Thus the young people met.

Mr. Ricker was graduated from Tech in 1914, and is now connected with the engineering department of the Western Electric Company in New York.

Ricker has just returned to accept an instructorship at the Institute. We wonder why.

On October 25 the Boston *Advertiser* announced the marriage of Miss Constance Fuller as follows:

The marriage is announced of Miss Constance Fuller, daughter of Mr. and Mrs. Arthur Ossoli Fuller of Cambridge, and Paul Sampson Howes, an architect of Akron, O. The bride was graduated from Radcliffe College in 1907, and after studying architecture at the Massachusetts Institute of Technology for three years she has since practiced that profession.

The Boston *Transcript* rushes to press with this:

Mr. and Mrs. Ervin Maling Stevens (Olive Bellows) of Cambridge announce the engagement of their sister, Miss Cora Ellen Bellows, formerly of Brookline, to Charles Francis Thompson of Colorado, a graduate of Dartmouth, '12, and of Massachusetts Institute of Technology, '14.

Frank Ralton, I, has accepted a position as mechanical engineer for the American Woolen Company at their mills in Lawrence.—“Flip” Bryant, XI, is still with Professor Weston doing sanitary work throughout the length and breadth of Massachusetts. It was just Flip’s luck to receive an assignment down the Cape during Reunion week.—Roy Hardy, I, has returned to Boston after having spent three months in Youngstown, Ohio, looking over the plant of the Trussed Concrete Steel Co. This concern now has the steel market pretty well cornered in Boston since Hardy’s return.—Tom Comber, I, is now with the United States Realty Company of New York City. This concern now has seven million dollar subway contracts in New York, and Comber has charge of the surface restoration on this work. This is a big job, but they have a pretty big man holding it down.—Wesley Bowler, XI, was back in Boston in August. He is with the U. S. Geological Survey and is now stationed at Macon, Ga. His principal occupation is killing seven-foot snakes. He says he likes his job. Who wouldn’t?—Ed. Reardon, I, writes that he is now foreman for Fred T. Ley Company on a building in Chicopee, Mass.—Del Hiller, VII, has returned from London where he was inspecting horses and cattle for the British government. He is now doing research work for Professor Sedgwick at the Institute. It is hard to conceive of Del researching for anything, but he says that it’s true, so we won’t dispute it.—“Cap” Richardson, I, is now with the Bemis Bag Company in Boston. “Cap” was formerly with the Aberthaw Company as superintendent of concrete construction. It seems a long way from concrete to the bag business, but if there is any connection “Cap” will find it. It used to be “Cap’s” pleasure to take your secretary on forty-mile hikes and he invited us to accompany him on a hike last month. As “Cap’s” legs appear to be

getting longer and longer, while our legs seem to be getting shorter as the months roll on, we decided to turn down his invitation, thus saving our reputation as a pedestrian.—Our Country's call for border duty was answered by Tom Callahan, I. Tom went down with the Seventh Regiment of New York. He is still doing police duty along the border.—George Simmons, XI, is now with the State Board of Health of Florida.—Raymond Gladding, XI, has left the General Electric at Lynn, and is now in the chemical department of Warren Bros. His specialty is road oils.—H. B. Richmond, VI, has left the General Vehicle Co. of Brooklyn, and is now instructing the young in the mysteries of electrical engineering as taught at the Institute. His letter is of more than passing interest:

Your letter in reference to the doings of the great 14ers is at hand. Let me say that I will be glad to help you out in any way that I am able and will start with your suggestion of sending in any news that has come to my attention:

First is a chance for a real article. You ought to get a pretty good story out of the fact that Dean Fales is back at Tech. Assistant in the mechanical department and has his name on the door. Guess he just couldn't keep away from the place.—I cannot give you an account of Perley's marriage *yet* for it has not happened. Just engaged, that's all. But when the affair does come off I will see that you get all the thrilling details. He is running some campaigns on heating apparatus for the Boston Edison at present.—C. W. Ricker, VI, has resigned from the Western Electric in New York to become an instructor in the electrical engineering department at Tech in place of N. Osann who has resigned.—S. W. Stanyan, VI, expects to get his B. S. from the University of California in December. The Faculty at Tech forgot to give it to him so he has gone after it in the sunny state of California. He was East last summer and barely escaped getting married in a motor boat in Maine, but got away with his life. He expects to do better next summer.—V. M. F. Tallman, VI, has been promoted to the power department of the Worcester Electric Light Co. and celebrated the fact by taking one of Worcester's best, Miss Phyllis Thayer, for his bride.—J. A. Judge, VI, is injecting M. I. T. efficiency into his father's paper mills at South Hadley Falls, Mass. Jim says that every time he sees the falls at Holyoke he thanks his lucky stars that he is not back at Tech writing up the "Holyoke Test."

Anent Perley's marriage, we are not as well versed in the details of this event as Perley probably is, and supposed that the marriage had been performed. As Perley is engaged to Richmond's sister, we don't see how he can pull off the ceremony without letting Richmond in on it. With the latter on our reportorial staff we feel sure that we can cover this event properly. Watch for it.

The New York *World* of August 6 says:

Illinois proposes to compete with Germany in the manufacture of dyes. The product which Germany is now planning to ship to this country by means of merchant submarines will soon be manufactured in this State, a large plant being under construction in Adams County.

The decision to operate such a plant followed a series of successful and exhaustive experiments conducted by Earl Cummins, a graduate of the Massachusetts Institute of Technology. He has specialized in the study of coal tar products and is a recognized authority in organic chemistry.

The only factory in the United States now engaged in the manufacture of dyes is in Buffalo, N. Y. It is said that it is managed by persons of German birth.

Germany has had the advantage over other nations, including the United States,

in being able to sell dyes lower than any other country. The industry has never been extended in the United States, due to the inability to compete with Germany in price. Since the war began a number of manufacturers have been contemplating embarking in the business, but it remained for Illinoisans to take the initiative.

The manufacture of dyes will mark a notable epoch in the manufacturing world of the West and will be of importance to every consumer who has been forced to pay higher prices for articles of wearing apparel because of the scarcity of dyes. Inability to secure raw materials from Europe has been a factor discouraging to many companies.

Hon Kun Chow, XIII, has invented a typewriter which utilizes 4,000 Chinese characters. Chow was formerly with the Curtis Aeroplane Co., but is now at his home in Shanghai, China. The Chinese dictionary has 50,000 characters but only about 6,000 are in ordinary use. Of these Chow has utilized the most common ones.—From the *Boston Post* of October 29 we hear of honors accorded to L. W. Snow as follows:

Leslie W. Snow, Dartmouth and Technology graduate, treasurer of the Dartmouth class of 1912, and the son of a prominent Rochester, N. H., business man, has achieved signal military honors which have been won by only 15 civilian citizens before now. He received notification yesterday that he has been awarded a commission as second lieutenant in the engineering corps of the United States army. Only 15 other civilians have ever passed these examinations.

Snow is living in Cambridge with his brother, Conrad E. Snow, who is now a graduate student in Harvard Law School, and is awaiting the receipt of his commission and his assignment to a post of duty.

Also we have, according to the papers, another claimant to military honors. H. G. Borden has successfully passed examinations in the engineering corps of the United States army, and in the coast artillery:

Mr. Borden is a graduate of the Massachusetts Institute of Technology and since graduation has been with the Public Utility Company of New York city. The United States Government has notified him that a second lieutenant's commission will be sent him within a week. In all probability he will accept in the engineering corps.

1915.

WILLIAM B. SPENCER, *Sec.*, 552 Main Street, Medford, Mass.
FRANCIS P. SCULLY, *Asst. Sec.*, 5 Exeter Park, Cambridge, Mass.

Our first reunion is now a memory and we have settled again into the old paths or it may be new ones. But it seems as though the majority were in new places, to judge by the amount of work we have in keeping in touch with the fellows as they move around. Even the secretary seems to have the ailment; he has recently gone to work in the New York office of Purdy and Henderson Company, engineers.

A number of the fellows who were back at the Institute instructing or taking a postgraduate course last year have joined us in the business or engineering world. "Bill" Mellema, IV, is with Westinghouse, Church, Kerr Co., of New York, a structural de-

signer in the construction department. George Nixon, also an M.S. in IV, is with Whidden-Beekman Co., contractors, 70 Devonshire street, Boston. He likes his new work very much.

Here is a letter from Jim Tobey; we have lost track of his course although he used to be XI:

Just a line to inform you of my whereabouts. I am located in the bustling, hustling city (so they call it) of Summit, N. J., as assistant health officer under T. J. Duffield, '14, who is health officer. This position I have held since attending the best little dedication ever staged in these United States; incidentally, I surprised the world, which, nevertheless, kept on whirling merrily, by graduating last June.

About three days after I arrived here, a company of infantry was formed and I have been acting as instructor and drill master of this bunch ever since. We have been getting plenty of experience and also large quantities of work on account of the epidemic of infantile paralysis. I am living at the Y. M. C. A., where I should be glad to entertain any nomadic fifteneers who might wander in this general direction.

Jim evidently did not get tired of scaring the lives out of the poor freshmen; he is going to keep up his work on the townspeople. But Jim has the class to thank for his success. Didn't we let him develop his voice as our cheer leader.—N. L. Medhurst, IV, has moved with his family to Kansas City, Kan. He is working in a steel fabrication plant. He likes conditions in the middle west but says that his next move will be to the Pacific Coast. Med's new address is 2135 Wyandotte avenue, Kansas City, Kan.—We have a card from Louis Zepfler. He has given up piloting freshmen through chem. lab. and says:

Put me down for a change of address. I am going to Rahway, N. J., as chemist in the manufacturing department of the Meick Chemical Co. Care of Meick Chemical Co., Rahway, N. J., will get me.

I won't ask any questions that you will have to answer because I know you're busy too.

D. H. McMurtrie sends his best wishes from La Tuque, Quebec, Can. He promises us a letter soon.

Ralph Joslyn, X, is working in the chemical department of the S. D. Warren Paper Mills, of Cumberland Mills, Me.—A letter which makes us justly proud of two of our classmates is printed below, together with clippings from a very interesting article in the *Charleston Gazette*, W. Va.

Just to let you know that Wardle and myself are still on earth and mighty busy at that. I am going to send you along the front page of the local paper. This flood, the worst in the history of West Virginia, has certainly kept us busy in the department of sanitary engineering. Wardle and I are keeping house together here and are pleasantly situated. West Virginia is a beautiful state and our work traveling about the state investigating water supplies and typhoid epidemics gives us a fine opportunity for seeing all kinds of country and meeting all types of people. It certainly is mighty good experience.

Now for the experience. In bold faced type the *Gazette* says:

Wonderful work is done by the department of health in the flooded district.

The story of the work done under the direction of the sanitary department of the West Virginia Department of Health, the hardships the sanitary engineer, Mayo Tolman, and his assistants, Ellis Tisdale and Andrew N. Wardle, went through

and the hard work they performed for the prevention of the breaking out of a pestilence in the flooded districts on Cabin creek and Coal river is almost miraculous. The full amount of good they have done will never be known, for it will never be a matter of human knowledge how many cases of typhoid fever were prevented, nor how many lives were saved by their untiring efforts in the flood-stricken region.

Money was not all that was needed. It was necessary to have men with the knowledge to properly use the supplies and with the energy and determination to use them to the best advantage, and to let no hardships stand in the way of their reaching the people who were in need of their services.

In an interview with Mayo Tolman and his assistant, Ellis Tisdale, the *Gazette* succeeded in getting a few of the harrowing experiences through which these men passed in order to disinfect the flooded districts, and make them fit to live in again.

The story tells of Mr. Mayo, with Wardle and Tisdale, traveling with packs which few soldiers carry, disinfecting wells, houses, and graveyards, traveling by day, sleeping anywhere by night, burying the dead, burning the animals who had died from drowning or starvation, and vaccinating the people in every village. Many were the ruses which were successfully attempted to subdue the fears of the poor people against vaccination. We are glad for Wardle and Tisdale that they had the opportunity to do this good work. We are proud that we can claim them as members of our class. Congratulations to Wardle and Tisdale.—S. L. Willis, III, is in Eustis, Quebec, working for the Eustis Mining Company. His company is finding it very hard to secure enough labor to run its mine and if conditions are not better than at the time of his writing the mine will have to close down. The shortage of men is due to the war.—Charlie Blodgett is working at the Kat-ahdin Pulp and Paper Co., Lincoln, Me., as chemist; Charlie Paine is also there; he went down soon after he was married and is keeping house.—By the way we have hardly gotten over the shock that Jack Dalton gave us directly after the Reunion. When he was last seen he looked better than ever.

It is one of our best enjoyments to pick up a nice plump looking envelope and guess who the lucky chap is whose marriage is announced inside. We have a nice little bunch to congratulate at this time. We all have known that Gene Place was considerably engaged even while at the "Stute." He was married to Miss Ruth Prior of Woburn on September 5. Leonard Marion, '15, and Howard Stewart, '17, assisted as ushers. Gene is now employed as an electrical engineer by the Youngstown Sheet & Tube Company. With his wife he will reside at Brownlee Woods, Boardman, Ohio, after December 1.—H. H. Whitcomb, whose home is in Littleton, married Miss Mildred Parker Carr, daughter of Mr. and Mrs. Eugene P. Carr of 18 Benton road, Somerville, Mass., on August 2. Mrs. Whitcomb is a graduate of Dana Hall, in the class of 1914.—Dave Hughes is our most recent member of the benedicts. On Tuesday, September 19, in New York City, Dave was married to Zella Paul, daughter of Mrs. Frances M. Paul of 263 Newbury street, Boston. Mrs. Hughes graduated from

Smith College, class of 1914. This looks like a little romance due to our "happy life at Tech."

We wish all of our newlyweds the best of success and the greatest happiness.—Pop Wood is busy at his work with the Metropolitan Water Commission of Massachusetts. He is working, both inside and out of doors, building pipe lines which a man can walk through. One of the latest completed lines is a section on Commonwealth avenue, out in Auburndale, about two miles long. Each length of pipe averaged twelve feet with a diameter of five feet. The pipe was of cast iron and weighed about six tons, costing \$25 per ton. Pop had the pleasure of walking through the two miles of pipe, before it was accepted, inspecting the joints, etc. We imagine that there was some crook in his back before he had finished his walk.—Edw. Schoeppe, IV, is working for M. Ward Easby, consulting and constructing engineer, 1420 Chestnut street, Philadelphia, as architectural designer.—Dong. Baker, VI, has been transferred to the Boston office of the Western Electric Co. His address is at his home in Melrose, 115 Upham street.—A. A. Cook is another '15 man to go to West Virginia. His address is State Hygienic Laboratory, Morgantown, W. Va.—M. E. Hill, captain of our Class Cross-Country Team, has been located. He is well and happy and writes the following:

There is so little that I might say about my own state of prosperity or otherwise, mostly the latter, that I'll simply say that I put in a shade better than two years with the New England Bureau of United Inspection, inspecting factories, etc., for about thirty-five fire insurance companies, and have recently gone with the New England Insurance Exchange, 141 Milk street, Boston, making rates for improved risks; that is, those equipped with automatic sprinklers, etc., also laying out specifications for reduction in rates. Was pleased to learn that my boss, Ralph Sweetland, and John Chapman, an engineer in the Improved Risks department, are both Tech men.

Shortly before the Fourth of July I happened to be taking passage for Gotham, and whom should I run into, after embarking, but one John Homan, of ye class of '15. Needless to say we immediately arranged to occupy the same room. All went well until John spotted two girls on the top deck, after which my best plans were of no avail. We had planned to get up at 5 in the morning, to go out on deck to get the fresh morning breezes but it was all I could do to get John shaved in time to disembark at 8. We had a wonderful breakfast that cost us the price of an ordinary meal ticket, after which we parted. Have seen John since in Haverhill where he is superintending a big shoe factory.

Take a run through the meadows to 38 Windsor street, Arlington, where I expect to hang my hat most of the time for the next year.

We were very glad to hear from Arnold B. Curtis, just after the Reunion, but were very sorry that at the time he was very ill. We hope that now he has fully recovered. His address is Warwick, R. I.—E. J. Casselman is with the Washington Steel and Ordnance Co., Washington, D. C. He sends his regards to all of the class and says if there are any chemists, chemical engineers, or electrochemists who want a job, his boss, William H. Keen, '05, may be able to place them. They must be M. I. T. grads of '14 or later.—C. A. Caldera, who is working down in

Brooklin, Me., wept bitter tears because he could not attend the great Tech celebration. He wrote the following:

You fellows who are on the grounds may hardly realize how lucky you really are, and we hope that you, who are so privileged, may enjoy it for us. Long life and a glorious future both to Tech and the class of 1915.

Howard L. King was still working for the New York Public Service Commission this summer. He wrote as follows:

Our tunneling has not progressed as rapidly as was expected. We were held up three weeks by a strike of the sand hogs and before that for a month by a disastrous blow-out. The cover over the work is too thin and the contractor seems to think that it is cheaper to pay the bills for a blow-out once in a while than to dump clay over the work and provide adequate cover. We are working in pressures up to 29 pounds above atmosphere. There are four tubes under the East river now under construction and two more will soon be started. Over 25 pounds, we get 60 per cent. bonus, which looks good when it comes around.

So far as I have heard Dick Heffler is the only Tech man to become famous by getting the bends.

E. A. Teeson is in New York employed by the United States Tire Co. We understand that Tee is engaged.—Here is a letter from the Philippine Islands. It is a mighty interesting one from Greville Haslam, and is headed Baguio School, Baguio, P. I.:

I'm very sorry that the distance compels me to be absent from the first reunion of our class, but I'll be there at the triennial if all goes well, and I'll eat and drink enough to make up for lost time.

I'm having a wonderful experience over here and am learning a few new things every day that even our all-wise professors at the Institute never heard of. The town of Baguio is 5,000 feet above sea level, so we are in the most equable climate in the world; every day is just like early June in the White Mountains. The Igorots (natives) are a harmless crowd that come about to a white man's elbow; they're awfully ugly, dirty, strong and smelly. An Igorot house is reminiscent of all the terrors of chem. lab., while the bugs in them have biology beaten to a frazzle.

This summer I'm going into British North Borneo after a rare species of moth for a Boston capitalist, nothing in it for me but the experience and anything I can pick up on the side, in the shape of orchids, birds of paradise, gems and insects. There's a good chance to get pearls for nothing in the coast villages. If I come back with my head I'll be in luck; the Dyakus, Moras, and Malays down there don't fancy white men much. The equator in summer won't feel too good to a Canadian but I'll stand the heat if I can dodge the malaria and dysentery.

The other masters here comprise three Harvard men, one from Clark College, and two women teachers. All the boys are sons of army officers on the Asiatic station, with the exception of a dozen civilians from Manila, so if the Jones bill goes through and the army is withdrawn, the school will close up.

There is some chance for a Tech man with an open mind and a bit of capital over here; I wouldn't advise a chap to come over looking for an opportunity unless he had enough finances to allow him to look around carefully for some little time. Undoubtedly there are big opportunities, and you may tell the chaps that I'll be glad indeed to make any inquiries for them, and also to let them know about chances that occur over here. I know a lot of them who'd appreciate the smokes; I get good cigarettes at eight for a cent; the cigars I'm burning cost about one and one-half cents each, and are fully the equal of the "Lords of England" I occasionally puffed in the old days at thirty cents a throw. Bananas are about five cents a dozen, cocoanuts two for five cents if you buy them retail, so you can see some things are dirt cheap.

The natives of the lowlands I consider a dirty, immoral, crooked, sneaky crowd, and my opinion is shared by all other whites over here, no matter what they may

say for the sake of political color. The mountain peoples, who are mostly savages, are a tough crowd but possess the qualities of loyalty, honesty and industry and are, therefore, liked by the Americans as much as the lowlands are distrusted. The two peoples are almost of different races.

The Jones bill and all similar measures are rot; the Filipinos know no more about governing themselves (or doing anything except steal) than does the average sheep; their ignorance extends to every subject except graft. I was talking to a clerk in the city government offices the other day, a man considered bright and among the foremost of his race; he thought Bombay and India were two of the states in the Union.

These peoples dress up and look well enough in a picture, but when they're at home they sit on the floor and eat with their hands.

Well, give my best to the crowd and tell them I'll have a glass of salni or tapny to them on the big night. I've cut out even beer over here—too many wrecks around here caused by it.

We sincerely hope that Greville's trip among the head-hunters was successful for him, not for them; and that he is again back at Baguio spreading education around.—N. D. Doane is now working as chemist for the American Water Works and Electric Co. at their filter plant in South Pittsburgh. The plant has a capacity of fifteen million gallons of water per day, and at present supplies about one hundred and twenty-five thousand people. It is said to be one of the best equipped mechanical filter plants in the country, but on account of the changeability of the river water used it requires very close supervision.

He would like to see any of the '15 or other Tech men who happen to come to Pittsburgh and feel that they would like to visit an up-to-date filter plant.

His mail address is, care of South Pittsburgh Water Co., Mt. Oliver Station, Pittsburgh, Pa.

We hope to have many successful gatherings among the centers of 1915 men this winter. In Boston, a committee is planning to arrange two large dinners and as many as possible of small luncheons to which the fellows may drop in. We hope that the policy of last year to have monthly luncheons or suppers in different cities may be successfully developed. These informal affairs mean much to the spirit and unity of the class. Let everyone join in making them a success. The information regarding the activities of the class will be sent by letter to each '15 man.

We have received recently the following address changes: V. F. Lam, 19 West St., New London, Conn.—F. L. Cook, 408 West Wellens Ave., Philadelphia, Pa.; Allan Abrams, Bemis Bag Co., St. Louis, Mo.; Wm. Mellema, Westinghouse, Church, Kerr Co., New York City; E. D. Bascom, Penn. State College, State College, Pa. (to teach applied mechanics).

1916.

JAMES MORRISON EVANS, *Sec.*, 17 Gramercy Park, New York, N. Y.
 DONALD BLAKE WEBSTER, *Asst. Sec.*, 18 Clarendon Street,
 Malden, Mass.

The class of 1916 graduated under the most favorable and promising conditions of any class since the founding of the Institute. It is now its turn to show the Alumni and Faculty that its record as a member of the Alumni Association will stand out even higher and greater than does its record as a graduating class from the Institute.

Thus far the secretaries have heard only indirectly of the doings and whereabouts of the members of the class. It is hoped, however, that after the appearance of this letter and the class letter of November, the writers will have heard directly from a good percentage of the class of 1916.

New York claims the largest number of the class, there being fifty or sixty of the "boys" employed in different parts of the city. "Knightie" Owen and eight of his following may be seen daily wandering about Washington Square admiring the artistic things of life. Knight is living with a crowd of artists and just how a mechanical engineer fits in such surroundings is beyond us all.—Knight is employed by some importing and exporting firm and he is well pleased with the work.

Any day between 9 a. m. and 5 p. m., under the employ of Westinghouse, Church, Kerr and Co., may be found "Abe" Reeve, "Moose" Jewett, Jim Ralston, Bob Crosby, "Gira" Crowell, Jim Evans, Jim Uhlinger, "Speed" Austin and George Petit.

Others met about town and at the Tech Club of New York are Jack Stafford, "Bill" Shakespeare, H. R. Bennett, Roger Lord, Ed. Whiting, Freddie Sutermeister, R. H. Mills, E. R. Mellen, E. W. and C. Lucas, Jr., and "Raef" Alfaro.—News comes to us from Boston that "Irv" MacDaniel has lost twenty pounds. We wonder if he and "Fat" Rennie have been trying to reduce this summer.—"Rusty" White is working in Lowell, Mass., where he is studying the woolen goods business.—"Cy" Guething is working for Westinghouse, Church, Kerr and Co. in St. Catharine's, Ont.—F. B. Hastie is back at the Institute completing his two courses, namely: Courses I and XI.—Chuck Loomis, after winning the National Junior 220-yard championship at Newark last month, was stricken with appendicitis and was detained in New York until the second week in October. We sincerely trust that he has fully recovered and is now resuming his work at the Institute.—Joseph Meigs has been appointed asphalt inspector for the city of Boston.—A clipping from the "New York Club *Fellow*" under the date October 11, says of Emmons Blaine:

Emmons Blaine, grandson of the late James G. Blaine, and who recently graduated from Boston Tech, is following the advice of the illustrious Horace Greeley.

He has purchased an estate in Wisconsin, where he will go in for farming. That is, not just ordinary raising of wheat, potatoes and those plebeian things, but cows and their kindly faced progeny are to be the pursuits of Emmons. The place was founded by the late Henry Favill and there is a herd of some two hundred fancy bred Holsteins on the five hundred-acre enclosure at the present time. Outside of the manor house there is a hospital for delicate calves, where they can be nursed back to health when they are indisposed. The former owner went in rather strong for the culture of the junior kine and as the place is fixed up for the educational and careful upbringing of the calf, perhaps the grandson of the plumed knight will follow along in his footsteps. Now that Emmons is within the environs of Chicago doubtless we will see quite a bit of him, for he cannot possibly sit all the time on his Wisconsin ranch and watch the rising generation of his hobby grow into mature cowhood. Other diversions will be absolutely necessary to his peace of mind.

We can picture Emmons pursuing the "kindly faced progeny."—Paul Duff writes from the ancestral home in Charlestown:

I am now working for an M. D. at Harvard and am giving a course of lectures on public health in the Cambridge evening schools.

Paul further writes of his classmates in Course VII:

Val Ellicot of Course VII is also a medical student at Johns Hopkins.—"Eke" Johnson, VII, is health agent of Watertown, Mass.—Walter Junkins, VII, is in Prof. Prescott's commercial microbiology laboratory in Boston.

"Ned" Hewins, erstwhile E.-in-C. of *The Tech* writes in part from Hampton, Virginia:

I am working at the Newport News Shipyard, following, strangely enough, the work I took at the 'Stute.

—Ping Yok Loo, Nelson MacRae and Ted Parsons are hard at work for the Winchester Repeating Arms Company in New Haven, Conn. They must be quite prosperous for Mac has written that he is, "now the proud father of a flivver." Mac gets down to the "big city" every now and then.—Fat Rennie, we are told, is studying astronomy and Greek statuary at the University of California. We wonder just what his degree will be.—Bill Farthing is with the Texas Oil Co. in Port Arthur, Tex. It is rumored that Bill has designs on the heart of the daughter of a Houston banker.—Don Webster is with the United States Rubber Co. in one of their Malden (Mass.) plants.—"Sandy" Clausen is with the Bemis Bro. Bag Co., at present in their Boston office.—Tom Little is also in their Boston office, and Bill Ogden has gone to India for the concern.—Hen Shepard has not yet buckled down to work. He is at present seeing Nicaragua.—"Bud" Kaula is a chemical engineer for the Katahdin Pulp and Paper Company in Lincoln, Me.—Charlie Makepeace is with his father, C. R. Makepeace & Co., mill engineers of Providence, R. I.—Charlie Lawrance is in the financial department of the Boston News Bureau.—George Maverick was with the Solvay Process Co. in Syracuse this summer, but is now serving as "slave" in the department of chemical engineering at the 'Stute.—Jack Stafford did not go to Cuba as he had planned and he is in business with his father in

Hackensack, N. J.—Carl Spear is in Cuba on a sugar plantation.—Among the '16 men at the U. S. Military Training Camp at Plattsburg, N. Y., this summer were Roger Lord, "Jap" Carr, Edgar Robinson and Don Webster.—Frank Hubbard and "Lev" Lawrason are back at the 'Stute.—Kem Dean has had an unfortunate summer of illness and is at present recuperating at his home in Brookline. His engagement was recently announced to Miss Marion Hill Smith of Brookline.

The July news of the class for the REVIEW was gathered and contributed entirely by "Rusty" White, our Alumni Council representative who, as Boston representative of the class at present, will have charge of any local matters that may come up."

It has been decided that 1916 shall have a night at the Tech Club of New York. The night found to suit most of those concerned is Thursday and, consequently, if any of the class happen to be in the city on a Thursday evening just drop around to the club and you will be sure to find some of the boys about the club. Address all mail to the secretary-treasurer, care of the Technology Club of New York, or to the assistant secretary.

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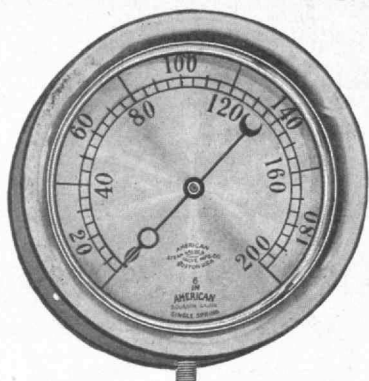
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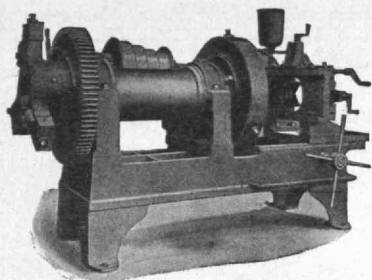
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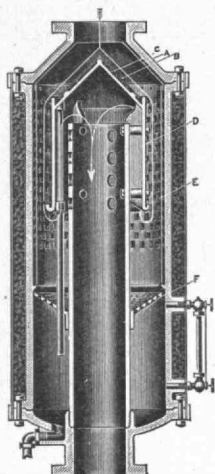
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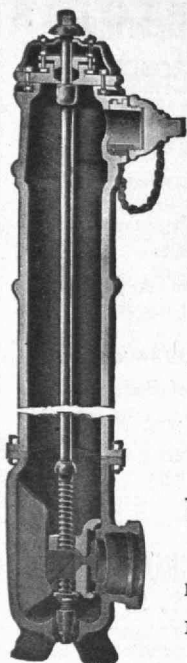
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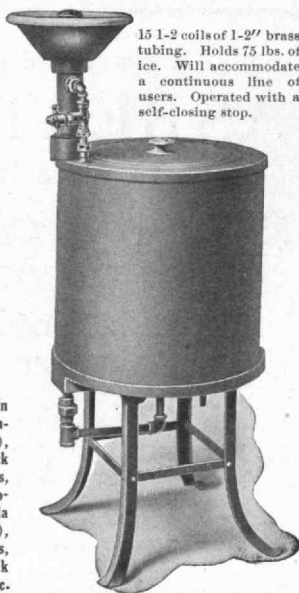
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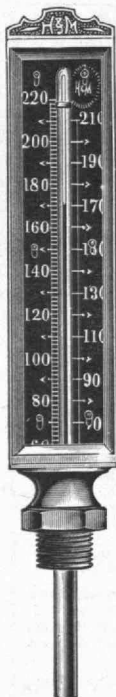
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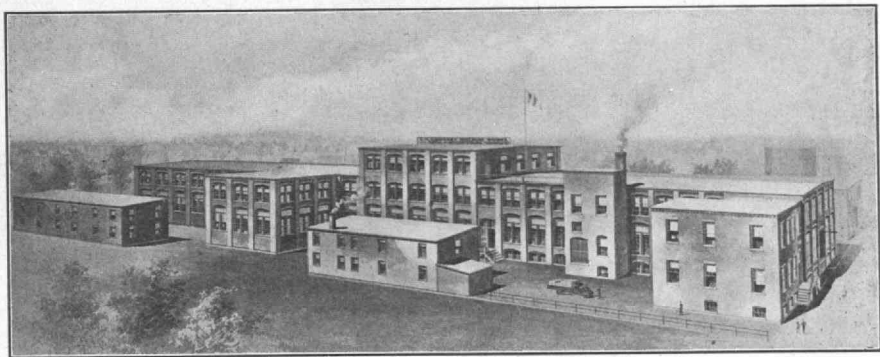
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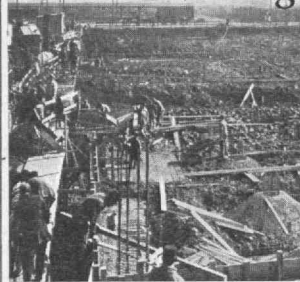
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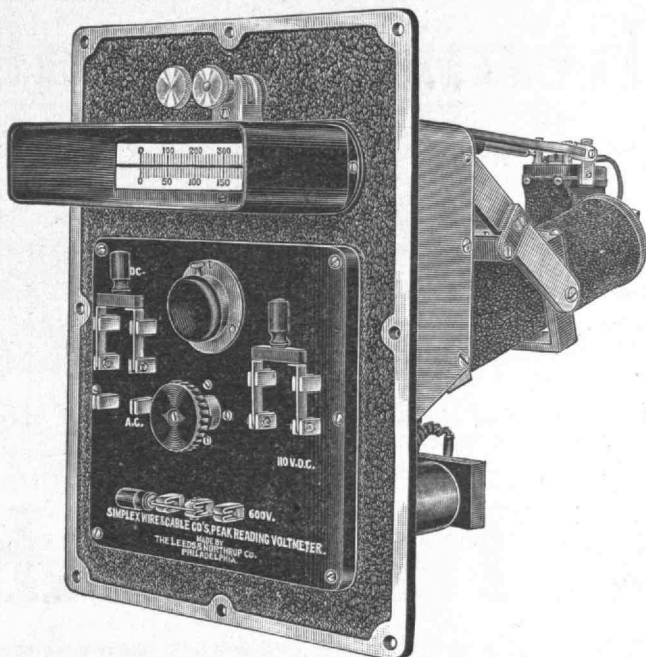
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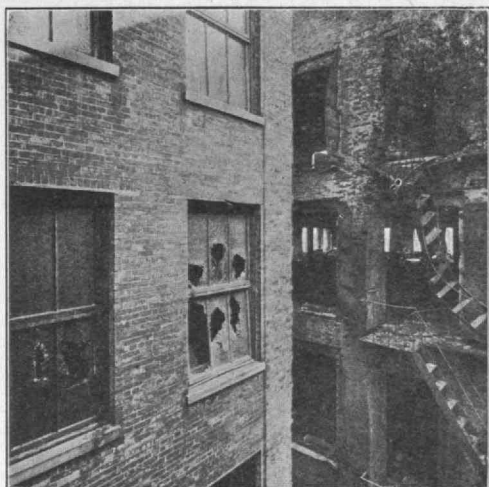
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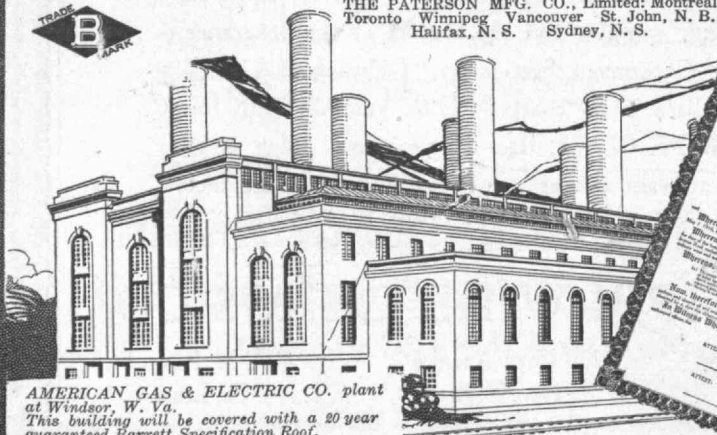
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